Final Environmental Impact Statement and Proposed Land-use Plan Amendments for the Energy Gateway South Transmission Project

BLM/WY/PL-14/009+5001
Case Files: WYW-174597
COC-72907
UTU-87237

BLM

Wyoming State Office

May 2016

Volume I-B

Chapter 4 through Appendix I

U.S. Department of the Interior
Bureau of Land Management

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Case Files
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Colorado: COC-72907
Utah: UTU-87237

Volume I-B

BLM Wyoming State Office
5353 Yellowstone Road
Cheyenne, Wyoming 82009

Cooperating Agencies
U.S. Forest Service – Intermountain Region
U.S. Army Corps of Engineers – South Pacific Division
U.S. Army Environmental Center
U.S. Department of Defense – Navy Region Southwest
Bureau of Indian Affairs – Western Region
U.S. Fish and Wildlife Service – Mountain-Prairie Region
National Park Service
Utah Reclamation Mitigation and Conservation Commission
State of Wyoming
State of Colorado
State of Utah
Carbon and Sweetwater counties, Wyoming
Mesa, Moffat, and Rio Blanco counties, Colorado
Carbon, Duchesne, Emery, Grand, Juab, Sanpete, Uintah, and Wasatch counties, Utah
Wyoming Conservation Districts (Little Snake River, Medicine Bow, Saratoga-Encampment-Rawlins, Sweetwater County)

May 2016

BLM Mission

To sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

Chapter 4
Cumulative Effects

CHAPTER 4 – CUMULATIVE EFFECTS

4.1 Introduction

This section presents the cumulative effects associated with the Project, including (1) a general definition of cumulative effects, (2) elements that were considered in the cumulative effects analysis, (3) the assessment approach, and (4) the results of the assessment of cumulative effects for the Project.

4.1.1 Summary of Changes from the Draft Environmental Impact Statement

Chapter 4 was updated to include additional environmental baseline information suggested or provided in substantive agency and public comments received on the Draft EIS and additional data collected to address alternative route adjustments made since the publication of the Draft EIS (refer to Section 2.5.2). The analysis of cumulative effects was updated to reflect the additional data.

Several of the alternative routes contain a series of route variations to compare local routing options. In the Draft EIS, the route variations were included in Chapters 3 and 4 with analysis of the alternative routes. Based on comments received on the Draft EIS, including requests for analysis of additional local route variations, the complexity of these routes necessitated a different presentation in the Final EIS. Thus, in the Final EIS, Chapters 3 and 4 describe the affected environment and environmental consequences associated with complete alternative routes including the Agency Preferred Alternative route, while the local route options are analyzed and compared in Appendix F. The methodology for comparing and analyzing the local route variations is the same as described in Chapters 3 and 4.

The past and present actions and RFFAs considered for the cumulative effects analysis have been updated from the Draft EIS. Also, the historic fires and vegetation and range management projects have been removed from the quantitative analysis because they do not adversely affect all resources, and are comprised of very large polygons that contribute to an over-estimation of cumulative development. In the Final EIS, they are discussed qualitatively for the resources affected by these projects. Additionally, projects that have gone through an authorization process were moved from the list of RFFAs to the list of current projects. Authorized projects are considered a past and present action due to the fact that construction may have begun or may begin at any time. These changes in cumulative projects used in the quantitative analysis, combined with updates in resource data for some resources, contribute to differences in cumulative development estimates between the Draft and Final EIS.

Substantive changes made between the Draft EIS and the Final EIS are demarcated in the left margin of this chapter by a vertical black line.

4.1.2 Definition

Cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the effect on the environment that results from the incremental impact of the action when added to other past and present actions and reasonably foreseeable future actions (RFFAs), regardless of what agency (federal or non-federal) or person undertakes other such actions. Cumulative impacts could result from individually minor, but collectively significant actions taking place over a period of time. The purpose of the cumulative effects analysis is to ensure that the decision-makers consider the full range of consequences of a Proposed Action and alternatives, including the No Action Alternative.

The CEQ has defined the resulting effects of a Proposed Action and its alternatives as direct and indirect. Direct effects are caused by the Project Action and occur at the same time and place. Indirect effects also are caused by the Project Action, but are later in time or further removed in distance, yet are still reasonably foreseeable (40 CFR 1508.8). Cumulative effects, discussed in this chapter, are the total effects on a given resource or ecosystem of all actions taken or proposed.

4.1.3 Elements Considered in Cumulative Effects Analysis

The cumulative effects assessment process considered (1) scoping and Project issues; (2) cumulative effect time frames and the resources (or receptors) that could be affected by the Proposed Action and Alternatives; (3) the geographical area in which the impacts would occur; and (4) other past and present actions and RFFAs that have, or could be expected to cause, impacts on these resources when considered with development of the Project.

4.1.3.1 Cumulative Effects Issues

The identification of issues for analysis in the EIS is discussed in Section 1.6.2. Those issues determined to potentially involve a cumulative effect with other past and present actions or RFFAs are included in the cumulative effects analysis. An exception is if the Proposed Action or alternatives would have no direct or indirect effects on a resource, would not contribute incrementally to cumulative effects, and is not included in the analysis for that resource.

4.1.3.2 Geographic and Temporal Scope

The geographic scope is the spatial extent where cumulative effects may occur on a resource. The geographic scope is assessed, and will often be different, for each cumulative effects issue. It is generally based on the natural boundaries of the resource affected. In several cases, the geographic scope for a resource is substantially larger than the corresponding alternative route study corridors for Project-related effects to consider an area large enough to encompass likely effects from other projects on the same resource.

The temporal scope is established by the time frame for a cumulative effects issue—that is, the duration of short-term and long-term effects anticipated. Together, the geographic and temporal scopes make up the cumulative impact analysis area (CIAA).

4.1.3.3 Cumulative Actions

In general, a cumulative action is a past, present, or other proposed action or RFFA that potentially has a cumulatively significant impact when combined with the Proposed Action. For purposes of this analysis, RFFAs are proposed projects or actions that have either applied for a permit from local, state, or federal authorities or which are publicly known. Tables 4-1 and 4-2 list known current and future projects and RFFAs located in or near the Project area. Past and present actions and RFFAs also are shown in MV-26 and MV-27. The projects listed in Tables 4-1 and 4-2 were incorporated into the analysis for the Project.

4.2 Cumulative Assessment Approach

The elements considered in the cumulative effects assessment, (1) cumulative effects issues, (2) geographic and temporal scopes defined for analysis, and (3) method(s) of quantitative and/or qualitative analysis are described by resource in Table 4-3. In general, quantitative analyses were performed for issues where the relevant data were available for the CIAA. For purposes of this assessment, quantitative estimates of cumulative effects on resource are based on the estimated spatial extent of development for the proposed Project and each past and present action and other RFFAs. The specific methods used in these estimations are discussed in this section.

The quantitative assessment of cumulative effects was performed using a seven-step process:

1. **Compile Resource Inventory for the CIAA.** The available resource in a CIAA was compiled by overlaying a polygon representing the CIAA identified for a resource issue over the relevant resource inventory data.
2. **Estimate Spatial Extent of Existing Development.** A single base layer of existing development was defined to include the existing land-use inventory developed for the effects analysis (refer to Section 3.2.11.4.1); buffered transmission lines, pipelines, railroads, and roads within the 2-mile-wide alternative route study corridors; LANDFIRE^{TM} data and buffered transmission lines, pipelines, railroads, and roads outside of the 2-mile-wide alternative route study corridors; and data collected for past and present actions in the Project area boundary. Table 4-4 presents the data components used to compile the base layer for existing development.
3. **Estimate Spatial Extent of RFFA Development.** A single base layer of RFFA development was established based on the rationale or assumptions outlined in Table 4-2. For oil and gas development areas, the associated development for each area was estimated based on approved maximum disturbance levels and well pad spacing (i.e., the approved maximum disturbance was distributed equally in the area boundary using approved well pad spacing). The spatial extent of RFFA development was then compiled into a single base. The base layer was not developed to contain individual attribute information; rather, the base layer includes a summary of all attributes.
4. **Estimate Spatial Extent of Project Development.** The area was compiled depending on the CIAA. For some resource issues, the area was created by buffering each alternative route by a specified amount (i.e., 1 mile on either side of an alternative route). For other resource issues, alternative routes were intersected with the CIAA. For example, the CIAA for water resources is the 8-digit HUC (subbasin) drainage areas crossed by the alternative routes. Each alternative route was intersected with the 8-digit HUC (subbasin) drainage areas to determine the spatial extent of Project development for each alternative route.
5. **Estimate Total Cumulative Development.** The layers were amalgamated to generate an estimated total cumulative development for each CIAA (i.e., the existing development data layer, the RFFA development layer, and the CIAA available resource inventory layer). In areas where existing development, RFFAs, and resource inventory all occurred, only the spatial extent of existing development and the CIAA available resource inventory were calculated (i.e., excluding RFFA development) to eliminate double-counting of development of an RFFA in areas already affected by past actions.
6. **Determine Incremental Project Development.** The spatial extent of the incremental Project effect on an available resource in the CIAA was determined by overlaying the existing and RFFA cumulative development layers with the estimated disturbance calculations generated from the Project description.
7. **Determine Remaining Available Resource.** The spatial extent of the remaining available resource (e.g., habitat) in the CIAA was determined by assessing the area outside of the estimated total cumulative development area.

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TABLE 4-1
PAST AND PRESENT ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
Multi-state Projects								
Northwest Colorado District Planning Unit								
Enterprise Mid-America Pipeline	Western Expansion II Project	Pipeline	Crosses Baxter Pass in Colorado, turns west, and proceeds along Interstate 70 to Thompson Springs, Utah	U241, C188, C196, C197, C270	96 miles	579	▪ 50-foot-wide corridor created by buffering the pipeline's centerline according to the description of the permanent right-of-way in the Environmental Assessment (EA) released July 2012 (Bureau of Land Management [BLM] 2012q)	Bureau of Land Management (BLM 2012r, Bing Imagery 2014)
Wyoming								
Federal								
Bureau of Land Management Wyoming State Office								
Idaho Power and Rocky Mountain Power	Gateway West 500-kilovolt (kV) and 230 kV Transmission Project	Transmission line	Starts at Windstar Substation near Dave Johnston Power Plant in Wyoming to Hemingway Substation near Melba, Idaho	W15, W21, W22, W30, W35	1,125 miles	31,844	▪ Centerline for the double-circuit 500kV sections and the single-circuit 500kV section buffered for a 250-foot-wide corridor and the 230kV section, for a 125-foot-wide corridor ▪ Based on information in the Gateway West Draft Environmental Impact Statement (EIS), 2011 (BLM 2011j)	Tetra Tech 2013
Bureau of Land Management Rawlins Field Office								
Anadarko	Atlantic Rim Natural Gas Project	Oil and/or gas development	Carbon County, Wyoming, south of Interstate 80 (I-80), east of Wyoming Highway 789	W110, W111, W32	270,420 acres	8,446	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 80 acres based on information in the EIS and Record of Decision for the Atlantic Rim Natural Gas Field Development Project (BLM 2007b)	BLM 2005f
Arch of Wyoming, LLC	Carbon Basin Mine	Coal mine	Located in Carbon County, Wyoming, north of I-80, east of Hanna, Wyoming	–	13,347 acres	13,347	▪ For this surface and underground mine, the area in the project boundary is considered as the development area since development at this point is unknown	Wyoming Department of Environmental Quality (WDEQ) 2011
Kennecott Uranium Company	Sweetwater Mine	Non-coal mine	23 miles north of Wamsutter, Wyoming	–	11,715 acres	11,715	▪ For this surface mine, the area in the project boundary is considered as the development area since development at this point is unknown	BLM 2001b
PacifiCorp	Dunlap I Wind Farm	Wind-energy facility	Near Medicine Bow, Wyoming	–	16,279 acres	60	▪ Turbine points digitized and given a size of 0.7 acres of disturbance per pad based on the 2012 National Agriculture Imagery Program (NAIP) aerial imagery of the structures as digitized by Environmental Planning Group (EPG)	NAIP 2012 as digitized by EPG
PacifiCorp	Seven Mile Hill Wind Energy Facility	Wind-energy facility	42 miles northeast of Rawlins, Wyoming	W15, W16, W21, W22	8,942 acres	57	▪ Turbine points digitized and given a size of 0.7 acres of disturbance per pad based on 2012 NAIP aerial imagery of the structures as digitized by EPG	NAIP 2012 as digitized by EPG
Power Company of Wyoming	Chokecherry and Sierra Madre Wind Farm	Wind-energy facility	South of I-80 and Rawlins, Wyoming	W30	214,122 acres	592	▪ 0.6 acres of disturbance per turbine and 1,000 wind turbines distributed evenly in the Project area boundaries (Chokecherry: 220-acre spacing; Sierra Madre: 218-acre spacing) ▪ Number of turbines based on information in the Chokecherry and Sierra Madre Programmatic Plan of Development (BLM 2012s) ▪ Density based on the Chokecherry and Sierra Madre Programmatic Record of Decision (BLM 2012t) as digitized by EPG	BLM 2012s BLM 2012t
Terry Hankins	Terry Hankins Cooper Mine	Non-coal mine	15 miles west and south of Grand Encampment, Wyoming	–	54 acres	54	▪ Area in the project boundary considered as the development area since development at this point is unknown	BLM 2001b
Warren Exploration and Production, Inc., Double Eagle Petroleum Company, and Anadarko Exploration and Production	Company Doty Mountain Plan D	Oil and/or gas development	19 miles southwest of Rawlins, Wyoming	–	1,368 acres	17	▪ 2 acres of disturbance per well pad and a density of 1 well pad per 152 acres (9 wells distributed across 1,368 acres) ▪ Based on information in the Plan of Development, 2012 (BLM 2012u)	BLM 2012v
Bureau of Land Management Rock Spring Field Office								
Ambre Energy	Black Butte Mine	Coal mine	25 miles east of Rock Springs, Wyoming	–	42,413 acres	42,413	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown	WDEQ 2011
Anadarko Petroleum Corp	Monell/Arch Unit Infill Project – Monell Unit	Oil and/or gas development	35 miles east of Rock Springs, Wyoming	–	10,146 acres	509	▪ 2.0 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the public scoping notice, 2012 (BLM 2012w)	BLM 2012x

TABLE 4-1
PAST AND PRESENT ACTIONS

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Anadarko Petroleum Corp.	Monell/Arch Unit Infill Project – Arch Unit	Oil and/or gas development	35 miles east of Rock Springs, Wyoming	–	12,540 acres	312	▪ 1.0 acre of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the public scoping notice, 2012 (BLM 2012w)	BLM 2012x
Chevron U.S.A., Inc.	Table Rock Field Oil and Gas Development	Oil and/or gas development	40 miles east of Rock Springs, Wyoming	–	13,633 acres	849	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres based on information in the Table Rock Field Oil and Gas Development EA and Finding of No Significant Impact (BLM 2012y)	BLM 2012z
Level III/Anadarko	Leucite Hills Mine	Coal mine	Southwest of Jim Bridger Coal Mine, 6 miles southeast of Superior, Wyoming	–	6,721 acres	6,721	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown	WDEQ 2011
PacifiCorp	Jim Bridger Mine	Coal mine	10 miles east of Superior, Wyoming	–	26,640 acres	26,640	▪ For this surface and underground mine, the area in the project boundary considered as the development area since development at this point is unknown	WDEQ 2011
State								
Wyoming Office of State Lands and Investments								
–	–	Coal mine (leases)	Within a 2-mile-wide study corridor for the Project	W21, W121, W299	3,183 acres	3,183	▪ Area in the project boundary considered as the development area since development at this point is unknown	Wyoming Office of State Lands and Investments [OSLI] 2013b
–	–	Non-coal mine (uranium leases)	Within a 2-mile-wide study corridor for the Project	–	632 acres	632	▪ Area in the project boundary considered as the development area since development at this point is unknown	Wyoming OSLI 2013b as digitized by EPG
–	–	Oil and/or gas development (leases)	Within a 2-mile-wide study corridor for the Project	W102, W110, W111, W116, W120, W121, W299, W32	11,111 acres	827	▪ 3.1 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Well pad density based on information in Chapter 3, Section 8, of the Wyoming State Statutes for Oil and Gas Development, (State of Wyoming n.d.) ▪ Well pad size based on the existing Atlantic Rim Oil and/or Gas Development Field in the Rawlins Field Office (BLM 2007b)	Wyoming OSLI 2013c
Local								
Carbon County								
–	Cassidy River Ranch	Residential subdivision	In Medicine Bow, Wyoming	–	8,024 acres	8,024	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Wyoming 2012b
PacifiCorp	Standpipe Substation	Substation	2 miles southeast of Hanna, Wyoming	–	26 acres	26	▪ Area in the project boundary considered as the development area since development at this point is unknown	Rocky Mountain Power 2011
Sweetwater County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Colorado								
Federal								
Bureau of Land Management Grand Junction Field Office								
–	–	Oil and/or gas development	Throughout the Grand Junction Field Office	C197	88,102 acres	697	▪ 1.5 acres of disturbance per well pad and a density of 1 well pad per 160 acres ▪ Based on information in Reasonably Foreseeable Development Scenario for Oil and Gas, Grand Junction Field Office (BLM 2012aa)	BLM 2012ab
Bureau of Land Management Little Snake Field Office								
Tri-State Generation and Transmission Association, Salt River Project Agricultural Improvement and Power District, Platte River Power Authority, and PacifiCorp	Trapper Mine	Coal mine	Southwest of Craig, Colorado; east of Colorado State Highway 13	–	10,569 acres	10,569	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown	BLM 2001b

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TriState/Western Fuels-Colorado, LLC	ColoWyo Coal Mine	Coal mine	12 miles north of Meeker, Colorado	–	14,369 acres	14,369	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown	BLM 2001b
WexPro Company	Carl Allen #45	Oil and/or gas development	1.5 miles northeast of Powder Wash, Colorado	–	6 acres	6	▪ Area in the project boundary considered as the development area since the development area is a minimal size	Wexpro Company 2012
–	–	Oil and/or gas development	Throughout the Little Snake Field Office	C106	314,599 acres	31,395	▪ 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Little Snake Field Office Reasonable Foreseeable Development: Oil and Gas in the Little Snake Field Office (BLM 2004b)	BLM 2012ab
Bureau of Land Management White River Field Office								
American Soda, LLP	Sodium Mine	Non-coal mine	21 miles southwest of Meeker, Colorado	–	250 acres	250	▪ For this surface and underground mine, entire project boundary considered since development at this point is unknown	BLM 2013f
Blue Mountain Energy, Inc.	Deserado Mine	Coal mine	Near the Moffat/Rio Blanco county line	C177	8,154 acres	8,154	▪ For this underground mine, entire project boundary considered since development at this point is unknown.	BLM 2009e
Blue Mountain Energy, Inc.	Deserado Mine Expansion	Coal mine	Just south of the Moffat/Rio Blanco county line	–	3,175 acres	3,175	▪ For this underground mine, entire project boundary considered since development at this point is unknown.	BLM 2012ac
Chevron Shale Oil Company	Oil Shale RDD	Oil shale and/or tar sands	19 miles northwest of Rio Blanco, Colorado	–	153 acres	153	▪ Area in the project boundary considered as the development area since development at this point is unknown	BLM 2012ad
EGL Resources, Inc.	Oil Shale RDD	Oil shale and/or tar sands	25 miles northwest of Rio Blanco, Colorado	–	155 acres	155	▪ Area in the project boundary considered as the development area since development at this point is unknown	BLM 2012ad
ExxonMobil Exploration Company and Natural Soda Holdings, Inc., Colorado Oil Shale Research	Development, and Demonstration Lease Tracts Project	Oil shale and/or tar sand development	Site 1 is located at T1S, R98W, Sec. 35 (Lots 1, 2, 3, and 4) Site 2 is located at T1S, R98W, Sec. 34 (Lots 1, 2, 7, and 8)	–	359 acres	359	▪ Area in the project lease area considered as the development area since development occurs throughout the project lease area ▪ Source for the project is from the ExxonMobil Exploration Company and Natural Soda Holdings, Inc. Colorado Oil Shale Research, Development, and Demonstration Lease Tracts Project EA, 2012 (BLM 2012ae)	BLM 2010d
Owner unknown	Gravel Pits	Non-coal mine	Two pits – 6 miles southeast of Meeker, Colorado and 8 miles northeast of Rangely, Colorado	–	24 acres	24	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown	BLM 2012af
Natural Soda	Sodium Mine	Non-coal mine	24 miles southwest of Meeker, Colorado	–	577 acres	577	▪ For this surface and underground mine, entire project boundary considered as the development area since development at this point is unknown	BLM 2013f
Questar Gas Company	Greasewood Gas Plant Compressor Station	Oil and/or gas development	18 miles southwest of Meeker, Colorado	–	110 acres	110	▪ Area in the project boundary considered as the development area since development at this point is unknown	BLM 2013g
Shell Frontier O&G, Inc	Oil Shale RDD	Oil shale and/or tar sands	Three units – 18 miles southeast of Rangely, Colorado	–	475 acres	475	▪ Area in the project boundary considered as the development area since development at this point is unknown	BLM2012ad
–	–	Oil and/or gas development	Throughout the White River Field Office	C175, C195, C196	593,738 acres	56,586	▪ 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the White River Draft Resource Management Plan/EIS for Oil and Gas Development (BLM 2012ag)	BLM 2012ab
State								
Colorado State Lands Board								
–	–	Oil and/or gas development	Throughout the Colorado portion of the Project study area	C91, C95, C101, C105, C100, C13, C17, C61, C186, C187	131,500 acres	491	▪ 3 acres of disturbance per well pad and a density of 1 well pad per 640 acres ▪ In the Hiawatha area, 3 acres per well pad with a well pad density of 1 per 40 acres ▪ Based on information received from the Colorado State Land Board during a call on March 14, 2013 (Osborn 2013)	Colorado State Land Board 2012
Local								
Garfield County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								

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Mesa County								
–	Clouse No. 1 and No. 2 Simple Land Divisions	Local development (annexation/ land division)	12 miles northeast of Fruita, Colorado	–	87 acres	87	▪ Entire land division area considered	Mesa County 2011
Moffat County								
–	Wilderness Ranches	Residential subdivision	30 miles north and east of Craig, Colorado	–	14,318 acres	14,318	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed.	Moffat County 2009
Rio Blanco County								
–	County Special-use Permit	Local development (industrial)	Located to the east of Rangely, Colorado near Colorado State Highway 139	–	15 acres	15	▪ Area in the project boundary considered as the development area since development at this point is unknown	Rio Blanco County 2012
Routt County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Utah								
Federal								
Bureau of Land Management Fillmore Field Office								
Central Utah Telephone	Fiber Optic Line	Communication facility	Nephi to Fountain Green	U639, U650	14 miles	33	▪ 20-foot buffer added to the fiber optic centerline based on information from the BLM Fillmore Field Office (BLM 2013h)	BLM 2013i
–	Mona South Pumped Storage Project	Transmission line	In Wide Canyon, 4 miles southwest of Mona, Utah	–	**Transmission:** 4.7 miles	**Transmission:** 143	**Transmission line** ▪ 4.7-mile-long centerline buffered for a 250-foot-wide right-of-way ▪ Based on information developed by EPG of average right-of-way widths for transmission lines of different voltages, 2013[5]	BLM 2013j
					Facilities: 394 acres	**Facilities:** 394	**Facilities** ▪ Entire project boundary considered since development at this point is unknown	
–	Mona North Pumped Storage Project	Transmission line	Old Canyon stream in the Long Ridge area west of Mona, Utah	–	**Transmission:** 6 miles	**Transmission:** 182	**Transmission line** ▪ 6-mile-long centerline buffered for a 250-foot-wide right-of-way ▪ Based on information developed by EPG of average right-of-way widths for transmission lines of different voltages, 2013[5]	BLM 2013ko
					Facilities: 833 acres	**Facilities:** 833 acres	**Facilities** ▪ Entire project boundary considered since development at this point is unknown	
Intermountain Power Agency	Intermountain Mona Lines No. 1 and 2	Transmission line	From Intermountain Power Project substation through Leamington Canyon to Adelanto, California	–	100 miles	1,818	▪ 345-kilovolt (kV) transmission centerlines buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b)	POWERmap Platts 2009 as digitized by EPG
Kern River Gas Transmission Company	Pipeline	Pipeline	Begins 6 miles southeast of Evanston, Wyoming, and terminates in Bakersfield, California	–	432 miles	15,709	▪ 36- to 42-inch diameter pipeline buffered to create a 300-foot corridor based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011a)	PennWell Map Search 2011
Magnum	Gas Storage Pipeline	Pipeline	Begins 2 miles northwest of Elberta, Utah, and terminates 4 miles east of Sugarville, Utah	–	373 acres	373	▪ Area in the project boundary considered as the development area since the boundary is meant to represent the pipeline right-of-way	BLM 2010e
PacifiCorp	Camp Williams to Sigurd No. 1	Transmission line	From Camp Williams, Utah County, Utah, to Sigurd Substation, Sevier County	–	0.3 miles	6	▪ 345kV transmission centerline buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b)	POWERmap Platts 2009 as digitized by EPG
PacifiCorp	Camp Williams to Sigurd No. 2	Transmission line	From Camp Williams, Utah County, Utah, to Sigurd Substation, Sevier County	–	0.3 miles	6	▪ 345kV transmission centerline buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b)	POWERmap Platts 2009 as digitized by EPG
PacifiCorp	Mona to Oquirrh Transmission Project	Transmission line	Begins at Clover Substation near Mona, Utah, and proceeds to the proposed Limber Substation site in Tooele County, Utah	–	114 miles	2,700	▪ 500kV portion of the transmission centerline buffered to 225 feet and 345kV portion buffered to 150 feet based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011b)	POWERmap Platts 2009 as digitized by EPG

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PAST AND PRESENT ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
Questar	Currant Creek Lateral Pipeline	Pipeline	Extends north from the Currant Creek Power Plant west of Mona, Utah, to the end of Questar's Main Line 104	–	6 miles	142	▪ 20-inch-diameter pipeline buffered to create a 200-foot corridor based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011a)	BLM 2013l
UNEV, LLC	Pipeline	Pipeline	Begins at Woods Cross, Utah, and has terminals in Cedar City, Utah, and northeast of Las Vegas, Nevada	–	409 miles	4,961	▪ 12-inch-diameter pipeline buffered to create a 100-foot corridor based on average scar widths visible on 2011 NAIP aerial imagery (NAIP 2011a)	BLM 2006b
Bureau of Land Management Moab Field Office								
Flatirons Resource, LLC	No. 1-4 Helium Well Project (includes well pad, pipeline and compressor station)	Industrial	15 miles southwest of Mack, Colorado	U490	7 acres	7	▪ 0.8 acres of disturbance per well pad and a 25-foot corridor for the pipeline ▪ Compressor station boundary considered to be fully developed	BLM 2013m
–	–	Oil and/or gas development	Throughout the Moab Field Office	U486, U487	273,246 acres	6,723	▪ 4 acres of disturbance per well pad and a density of 1 well pad per 160 acres ▪ Based on information in the Reasonably Foreseeable Development Scenario for Oil and Gas Development for the Moab Field Office (BLM 2005g)	BLM 2012ah
Bureau of Land Management Price Field Office								
Anadarko Petroleum Corporation	Ferron Natural Gas Project	Oil and/or gas development	North of Price, Utah	U498, U587, U628, U629, U765	108,680 acres	812	▪ 1.38 acres of disturbance per well pad and a density of 1 well pad per 160 acres ▪ Well pad size is based on the number of wells and well pad density in the project boundary ▪ Density based on information in the Appeals from the Ferron Natural Gas Record of Decision (Interior Board of Land Appeals [BLM] 2003)	BLM 1998b
Bill Barrett Corporation	Peter's Point Loop Pipeline	Pipeline	T12S, R16E, Sec. 26, 27, 35	–	3 miles	18	▪ Pipeline digitized and buffered to create a 50 foot wide corridor based on maps and existing right-of-way widths given in the Peter's Point Loop EA (BLM 2011k)	BLM 2011k
Bill Barrett Corp.	West Tavaputs Plateau Project	Oil and/or gas development	30 miles east-northeast of Price, Utah	–	137,932 acres	1,723	▪ 2 acres of disturbance per well pad and a density of 1 well pad per 160 acres ▪ Based on information in the West Tavaputs Plateau Record of Decision and Final EIS, (BLM 2010f)	BLM 2012af
Interwest Mining Company	Deer Creek Coal Mine, Coal Exploration	Coal mine	T16S, R6E, Sec. 22-27	U629	25,958 acres	25,958	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	Tetra Tech 2012
Wasatch Natural Resources	Long Canyon Coal Lease	Coal mine	3 miles east of Scofield along a north-south trending ridge east parallel to Pleasant Valley/Scofield	–	7,623 acres	7,623	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	BLM 2012ah
–	–	Oil and/or gas development	Throughout the Price Field Office	U493, U494, U496, U537, U544, U585, U586, U587, U600, U629, U630	175,948 acres	872	▪ 1 acre of disturbance per well pad and a density of 1 well pad per 160 acres ▪ Based on information in the Price Field Office Proposed Resource Management Plan/Final EIS (BLM 2008d)	BLM 2012ah
Bureau of Land Management Richfield Field Office								
–	–	Oil and/or gas development	Throughout the Richfield Field Office	U600, U630	49,704 acres	4,934	▪ 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Well pad size based on information in the Reasonably Foreseeable Development Scenario for Oil and Gas Development in the Richfield Field Office, March 2005 ▪ Well pad density based on information from Utah Administrative Code R649-3-Drilling and Operating Practices	BLM 2012ah
Bureau of Land Management Salt Lake Field Office								
Chevron	Rangely to Salt Lake City Pipeline	Pipeline	Begins near Rangely, Colorado and terminates near Salt Lake City, Utah	U420, U430, U300	368 miles	4,461	▪ 10-inch-diameter pipeline buffered to create a 100-foot corridor based on average scar widths visible on the 2011 NAIP aerial imagery (NAIP 2011a)	PennWell Map Search 2011

TABLE 4-1
PAST AND PRESENT ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
Bureau of Land Management Vernal Field Office								
Bill Barrett Corporation	Blacktail Ridge Exploration and Development Agreement (EDA)	Oil and/or gas development	West of Duchesne, Utah	U421, U420	98,874 acres	6,108	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012ai)	URMCC2013a
Bill Barrett Corporation	Lake Canyon EDA	Oil and/or gas development	South of Fruitland, Utah	U424, U426, U427	244,730 acres	15,341	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012ai)	URMCC 2013a
Encana	North Chapita Wells Natural Gas Development	Oil and/or gas development	6 miles northwest of Bonanza, Utah	–	9,191 acres	453	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012ai)	BLM 2012aj
Enduring Resources	Rock House Development	Oil and/or gas development	11 miles southwest of Bonanza, Utah	–	4,859 acres	31	▪ 2 acres of disturbance per well pad and a density of 1 well pad per 285.8 acres (17 pads distributed across 4,859.2 acres ▪ Based on information in the Saddletree Draw Leasing and Rock House Development Proposal EA, December 2007 (BLM 2007c)	BLM 2012aj
EOG Resources, Inc.	Chapita Wells-Stagecoach Area Natural Gas Development	Oil and/or gas development	10 miles southeast of Ouray, Colorado	U300, U285, U290	31,861 acres	220	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 320 acres ▪ Based on information in the Chapita Wells-Stagecoach Area Natural Gas Development Final EIS, January 2008 and the Greater Natural Buttes Final EIS, March 2012 for well pad size (BLM 2008k, 2012ak)	BLM 2012aj
Gasco Energy, Inc.	Uinta Natural Gas Development Project	Oil and/or gas development	T9S, R15–19E T10S, R14–19E T11S, R15–18E	U400, U401	165,895 acres	15,833	▪ 3.8 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Gasco Final EIS, June 2012 (BLM 2012al)	BLM 2011l
–	Gilsonite Mines	Non-coal mine	Throughout the southern portion of the Vernal Field Office	U300, U391, U400	174 miles	212	▪ The linear mines were assumed to be 10 feet wide based on an average width of mining scars visible on 2011 NAIP aerial imagery (NAIP 2011c)	BLM 2008l
Kerr-McGee Oil and Gas Onshore LP	Greater Natural Buttes Project	Oil and/or gas development	T8S, R20-23E T9S, R20-24E T10S, R20-23E T11S, R21-22E	U260, U280, U285, U290, U300	160,285 acres	9,955	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in Greater Natural Buttes Final EIS, March 2012 (BLM 2012ak)	BLM 2012aj
Koch Exploration Company	North Alger EA II	Oil and/or gas development	T10S, R19E, Sec. 27-28, 34-35 T11S, R19E, Sec 1	–	2,390 acres	210	▪ 3.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the North Algers Project EA, October 2012 (BLM 2012n)	BLM 2012aj
Newfield Gusher Development	–	Oil and/or gas development	5 miles northeast of Randlett, Utah	U390, U391	38,138 acres	2,324	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012ai)	BLM 2012aj
Petro-Canada Resources (USA), Inc.	Rye Patch EA	Oil and/or gas development	21 miles south of Duchesne, Utah	–	5,506 acres	11	▪ 2.1 acres of disturbance per well pad and a density of 1 well pad per 790.9 acres (7 pads distributed across 7,283 acres ▪ Based on information in the Rye Patch Exploratory Drilling EA, July 2007 (BLM 2007d)	BLM 2012aj
Questar Exploration and Production Company	Greater Deadman Bench	Oil and/or gas development	8 miles northeast of Ouray, Colorado	U390, U310, U241	98,538 acres	5,772	▪ 2.3 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Greater Deadman Bench Final EIS, January 2008 (BLM 2008i)	BLM 2012aj

TABLE 4-1
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–	Seep Ridge Road	Highway/road	From Ouray, Colorado to Uintah County line	–	702 acres	702	▪ Area in the project boundary considered as the development area since the boundary is meant to represent the actual road development	BLM 2012an
Stewart Petroleum	Tumbleweed II	Oil and/or gas development	37 miles southwest of Bonanza, Utah	–	7,283 acres	16	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 1,040.4 acres (7 pads distributed across 7,283.1 acres) ▪ Based on information in the Tumbleweed II Exploratory Natural Gas Drilling Project Final EA, June 2010 (BLM 2010g)	BLM 2012aj
XTO Energy	Riverbend Directional Infill	Oil and/or gas development	T10S, R19-20E	U300, U400	17,127 acres	2,137	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 20 acres ▪ Based on information in the River Bend Unit Infill Development Environmental Assessment and Biological Assessment, July 2012 (BLM 2012ao)	BLM 2012aj
–	–	Oil and/or gas development	Throughout the Vernal Field Office	U241, U280, U310, U390, U431, U300, U400	435,064 acres	14,059	▪ 2.5 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Greater Uinta Basin Oil and Gas Cumulative Impacts Technical Support Document, March 2012 (BLM 2012ai)	BLM 2012ah
Ashley National Forest								
Berry Petroleum	South Unit Oil and Gas Development	Oil and/or gas development	Between Antelope and Sowers Canyon in the Duchesne Ranger District	U431	25,608 acres	237	▪ 1 acre of disturbance per well pad and a density of 1 well pad per 106.7 acres (6 pads per 640-acre section) ▪ Based on information in the South Unit Oil and Gas Development Project Record of Decision, February 2012 (USFS 2012e)	USFS 2007
Manti-La Sal National Forest								
Canyon Fuel Company, LLC	Skyline Mine	Coal mine	3 miles west of Clear Creek, Utah	U600	10,455 acres	10,455	▪ Area for this underground mine in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
–	Flat Canyon Coal Lease Tract	Coal mine	5 miles west of Clear Creek, Utah	U600	2,717 acres	2,717	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	USFS 2013d
Fossil Rock Fuels, LLC	Coal Exploration Drilling	Coal mine	10 miles northwest of Orangeville, Utah	–	8,707 acres	8,707	▪ Area in the project boundary considered as the development area since development at this point is unknown	USFS 2012f
Liberty Pioneer Energy Source, Inc.	Liberty Pioneer #10-17 Gas Exploration	Oil and/or gas development	25 miles northwest of Huntington, Utah along Utah State Route 31 in Sanpete County	–	2 acres	2	▪ Area in the project boundary considered as the development area since development at this point is unknown	USFS 2012g
Sunroc Corporation	Chicken Creek Surface Gypsum Mine	Non-coal mine	2 miles east of Levan, Utah	–	57 acres	57	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown ▪ For the proposed access road, centerline buffered for a 25-foot width	USFS 2012h
Uinta-Wasatch-Cache National Forest								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Surface Transportation Board								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Utah Reclamation Mitigation and Conservation Commission (URMCC)								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Utah Reclamation Mitigation and Conservation Commission and Bureau of Indian Affairs								
Bill Barrett Corporation	Blacktail Ridge	Oil and/or gas development	In Duchesne County, 8 miles east of Fruitland, Utah, and 2 miles north of U.S. Highway 40	U421	933 acres	21	▪ 3.5 acres of disturbance per well pad and a density of 1 well pad per 159 acres (5 wells on 790.52 acre parcel) ▪ Based on information in the Blacktail Ridge 12-Well Exploratory Drilling Project EA Scoping Notice, November 2012 (URMCC 2012)	URMCC 2013b

TABLE 4-1
PAST AND PRESENT ACTIONS

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Bureau of Reclamation								
Bureau of Reclamation and Sanpete Water Conservancy District	The Narrows Dam and Reservoir Project (including highway relocation, tunnel, and East Bench and Oak Creek Pipeline)	Dam and reservoir project	6 miles northeast of Fairview, Utah	U600 (Tunnel and Highway), U630, U636 (pipelines)	**Reservoir:** 669 acres	Reservoir: 669	▪ **Reservoir:** Entire project boundary considered since development at this point is unknown.	Central Utah Water Conservancy District 2012
					Pipelines: 16 miles	Pipelines: 59	▪ **Pipelines:** Pipelines buffered for a 30-foot-wide corridor.	
					Highway: 3 miles	Highway: 8	▪ **Highway:** Centerline buffered for a 24-foot-wide corridor	
					Tunnel: 0.6 miles	Tunnel: 2	▪ **Tunnel:** Centerline buffered for a 30-foot-wide corridor based on aerial imagery scar measurement of the current alignment	Sanpete Water Conservancy District 2012
					Dam: 0.3 acres	Dam: 0.3	▪ **Dam:** The development assumption is to buffer the dam point to 14,251 square feet.	
					–	–	▪ All based on information from the Narrows Project Final EIS, November 2012 (U.S. Bureau of Reclamation 2012)	
State								
Central Utah Water Conservancy District								
–	Roosevelt Pipeline	Pipeline	Extends from Roosevelt, Utah, to the west 9 miles	U420	18 miles	6,371	▪ Pipeline buffered to create a 3,000-foot corridor based on direction from the Central Utah Water Conservancy District to avoid affecting the pipeline with the proposed Project	Central Utah Water Conservancy District 2012
State of Utah School and Institutional Trust Lands Administration (SITLA)								
Red Leaf Resources	Red Leaf Project	Oil shale and/or tar sand	Uinta Basin, Utah	–	16,803 acres	16,803	▪ Area in the project boundary considered as the development area since development at this point is unknown	SITLA 2012
–	University of Utah leases	Educational	8 miles southeast of Columbia, Utah	–	2,802 acres	2,802	▪ Area in the project boundary considered as the development area since development at this point is unknown	SITLA 2014a
–	Utah National Guard Engineering Battalion training area	Military training/testing site	6 miles east of Price, Utah	–	163 acres	163	▪ Area in the project boundary considered as the development area since development at this point is unknown	SITLA 2014a
–	White Sands Missile Launch Facility (abandoned)	Military training/testing site	Near Green River, Utah	U487	728 acres	728	▪ Area in the project boundary considered as the development area since development at this point is unknown	SITLA 2014a
–	Arches Overlook, Grand County; Price Industrial, Carbon County; Price Industrial Large Lots; Price Fairgrounds, Carbon County; Johnsons Up On Top/Moab Golf Course; Moab - USU/CEU Branch Campus Site, Grand County; Price Fairgrounds Exchange Parcel; Price City 40, Carbon County; South Price Residential, Carbon County	Multiple types of development[4]	Throughout the Utah portion of the Project area	–	10,633 acres	10,633	▪ Entire project lease boundary considered since development in each lease or project area currently is unknown	SITLA 2014a
–	Mancos Hills Industrial Park, Emery County	Industrial	3 miles west of Green River, Utah	U488	2,556 acres	2,556	▪ Area in the project boundary considered as the development area since development at this point is unknown	SITLA 2014a
–	–	Coal and Non-coal mine	Throughout the Project area	U300, U486, U487, U488, U489, U730	106,858acres	106,858	▪ Area in the project boundary considered as the development area since development at this point is unknown	SITLA 2014b
–	–	Oil and/or gas development	Throughout the Project area	U241, U242, U280, U285, U290, U300, U310, U390, U400, U401, U406, U410, U411, U413, U416, U419, U430, U432, U436, U437, U438, U442, U443, U445, U486, U487, U488, U489, U490, U493, U495, U496, U498, U502, U504, U506, U508, U512, U514, U516, U520, U523, U524, U527, U537, U546, U548, U585,	759,875 acres	15,362	▪ 3 acres of disturbance per well pad and a density of 1 well pad per 107 acres ▪ An average of 6 wells per section based on Utah Department of Oil, Gas, and Mining map found at this website: http://mapserv.utah.gov/oilgasmining/	SITLA 2014c

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				U586, U587, U600, U621, U628, U629, U631, U636, U650, U730, U731, U734, U765				
–	–	Oil shale tar sands development	Throughout the Project area	U280, U285, U290, U300	140,013 acres	140,013	▪ Area in the project boundary considered as the development area since development at this point is unknown	SITLA 2014c
Utah Division of Natural Resources – Oil, Gas and Mining								
Andalex Resources, Inc.	Centennial Mine	Coal mine	6 miles northeast of Helper, Utah	–	6,556 acres	6,556	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Canyon Fuel Company, LLC	Banning Siding Loadout	Coal mine	8 miles east of Wellington, Utah	–	40 acres	40	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Canyon Fuel Company, LLC	Dugout Canyon Mine	Coal mine	11 miles northeast of Wellington, Utah	–	9,383 acres	9,383	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Canyon Fuel Company	Soldier Canyon Mine	Coal mine	12 miles northeast of Wellington, Utah	U523	7,140 acres	7,140	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Carbon Resources, LLC	Kinney # 2	Coal mine	East of Scofield, Utah	–	709 acres	709	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Castle Valley Mining, LLC	Bear Canyon Mine	Coal mine	10 miles west of Huntington, Utah	–	10,831 acres	10,831	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
COVOL Engineered Fuels, LLC	COVOL Site	Coal mine	Industrial area on Ridge Road, Carbon County, Utah	–	31 acres	31	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Energy West Mining Company	Cottonwood Waste Rock Site	Coal mine	12 miles northwest of Orangeville, Utah	–	2,153 acres	2,153	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Hiawatha Coal Company, Inc.	Hiawatha Mine	Coal mine	15 miles southwest of Price, Utah	–	11,623 acres	11,623	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Hidden Splendor Resources	Horizon Mine	Coal mine	5 miles east of Scofield, Utah	–	1,539 acres	1,539	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Intermountain Power Agency	Wildcat Loadout	Coal mine	3 miles west of U.S. Highway 6, on Consumers Road near Helper, Utah	U548	268 acres	268	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
PacifiCorp	Trial Mountain Mine	Coal mine	12 miles west of Orangeville, Utah	–	3,492 acres	3,492	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Savage Services Corporation	Savage Coal Terminal	Coal mine	4 miles south-southeast of Price, Utah	–	166 acres	166	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Sunnyside Cogeneration Associates	Star Point Waste Fuel	Coal mine	3 miles north of Hiawatha, Utah	–	156 acres	156	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Sunnyside Cogeneration Associates	Sunnyside Refuse/Slurry	Coal mine	25 miles east of Price, Utah	–	331 acres	331	▪ Area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
Utah American Energy, Inc.	Horse Canyon Mine (Lila Canyon extension)	Coal mine	7 miles east of Cedar, Utah	–	4,566 acres	4,566	▪ For this surface mine, area in the project boundary considered as the development area since development at this point is unknown	UDNR 2013
West Ridge Resources	West Ridge Mine	Coal mine	10 miles north of Sunnyside, Utah	–	5,990 acres	5,990	▪ For this underground mine, area in the project boundary considered as the development area since development at this point is unknown.	UDNR 2013

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Local								
Carbon County								
–	All-Terrain vehicle trail	Local development (recreation)	North of Price, Utah, to the southeast, terminating near Sunnyside, Utah	U492	36 miles	66	▪ Trail centerline is buffered to 15 feet wide based on existing portions of the trail in 2011 NAIP aerial imagery	Carbon County, Utah 2011a
–	Clear Creek subdivision	Residential subdivision	4 miles south of Scofield, Utah	–	19 acres	19	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Dennis Plat of Spring Glen subdivision	Residential subdivision	1 mile south of Helper, Utah	–	23 acres	23	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Frank Jr. and Judy Saccomanno subdivision	Residential subdivision	1 mile southeast of Helper, Utah	–	5 acres	5	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Kenilworth subdivision	Residential subdivision	2 miles east of Helper, Utah	–	42 acres	42	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Spring Glen Townsite	Residential subdivision	1 mile south of Helper, Utah	–	53 acres	53	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Theo Vista subdivision	Residential subdivision	1 mile south of Helper, Utah	–	5 acres	5	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
City of Helper								
–	Castle Gate Addition subdivision	Residential subdivision	Western portion of the city limits of Helper, Utah	–	69 acres	69	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Fitch’s subdivision	Residential subdivision	Western portion of the city limits of Helper, Utah	–	1 acre	1	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Giacoletto subdivision	Residential subdivision	Northern portion of the city limits of Helper, Utah	–	2 acres	2	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Hillcrest Addition subdivision	Residential subdivision	Eastern portion of the city limits of Helper, Utah	–	6 acres	6	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	New Helper Townsite subdivision	Residential subdivision	Northern portion of the city limits of Helper, Utah	–	23 acres	23	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
–	Sheya Addition subdivision	Residential subdivision	In the municipal boundary of Helper, Utah	–	8 acres	8	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Carbon County, Utah 2011b
Daggett County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Duchesne County								
–	Airport Estates subdivision	Residential subdivision	On the western edge of Roosevelt, Utah	–	323 acres	323	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Alfred Stringham subdivision	Residential subdivision	T3S, R2W, Sec. 9	–	41 acres	41	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Amy Hemphill subdivision	Residential subdivision	T3S, R1W, Sec. 18	–	81 acres	81	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Arch View Ranchettes subdivision	Residential subdivision	15 miles west of Duchesne, Utah	U421	51 acres	51	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Brad Knight subdivision	Residential subdivision	2 miles south of Roosevelt, Utah	–	21 acres	21	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Brad Mikesell subdivision	Residential subdivision	T11S, R11E, Sec. 7	–	126 acres	126	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Brad Taylor subdivision	Residential subdivision	T3S, R5W, Sec. 12	–	80 acres	80	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Bridgeland BV – Chevron	Residential subdivision	T3S, R3W, Sec. 34	–	41 acres	41	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Cedar Mountain No. 6 and 6A subdivision	Residential subdivision	22 miles west of Duchesne, Utah	U426	1,698 acres	1,698	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Cedar Mountain No. 8 subdivision	Residential subdivision	6 miles west of Duchesne, Utah	–	334 acres	334	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009

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–	Cedar Mountain No. 9 subdivision	Residential subdivision	13 miles west of Duchesne, Utah	U421	1,967 acres	1,967	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Cove Estates subdivision	Residential subdivision	Northern portion of Roosevelt municipal boundary, Utah	–	416 acres	416	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Dale Gines subdivision	Residential subdivision	6 miles north of Duchesne, Utah	–	102 acres	102	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	David Thacker subdivision	Residential subdivision	T2S, R3W, Sec. 28 and 33	U420	200 acres	200	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Dean Roberts subdivision	Residential subdivision	T2S, R3W, Sec. 15	–	160 acres	160	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Deer Field subdivision	Residential subdivision	25 miles west of Duchesne, Utah	–	43 acres	43	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Deloris Crespo and Jaime Trujillo subdivision	Residential subdivision	T3S, R7W, Sec. 27	–	39 acres	39	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	D.J. Crozier Land and Livestock LLC subdivision	Residential subdivision	T3S, R2W, Sec. 2	U410	41 acres	41	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Dennis Manning subdivision	Residential subdivision	T3S, R2W, Sec. 10	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Duncan – Price subdivision	Residential subdivision	T3S, R2W, Sec. 1	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Duchesne Land LC - Petroglyph Energy	Residential subdivision	T4S, R4W, Sec. 8, 17, and 18	–	1,198 acres	1,198	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Elk Tracks at Golden Eagle subdivision	Residential subdivision	5 miles northwest of Duchesne, Utah	U420	789 acres	789	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	EP Energy Belcher	Oil and/or gas development	T2S, R4W, Sec. 32	–	80 acres	80	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Fruitland Ranchettes subdivision	Residential subdivision	24 miles west of Duchesne, Utah	–	26 acres	26	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Fruitland SS District subdivision	Residential subdivision	T3S, R9W, Sec. 25	–	81 acres	81	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Golden Eagle subdivision	Residential subdivision	5 miles northwest of Duchesne, Utah	–	359 acres	359	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Great Basin Estates I subdivision	Residential subdivision	7 miles northwest of Duchesne, Utah	U420	319 acres	319	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Hidden Meadow subdivision	Residential subdivision	24 miles west of Duchesne, Utah	–	63 acres	63	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Highland Estates subdivision	Residential subdivision	2 miles south of Roosevelt, Utah	–	12 acres	12	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Hock subdivision	Residential subdivision	T3S, R7W, Sec. 30	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Ioka Meadows subdivision	Residential subdivision	2 miles southwest of Roosevelt, Utah	–	38 acres	38	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Ivan German subdivision	Residential subdivision	T3S, R1W, Sec. 5	–	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Jerry Thacker subdivision	Residential subdivision	T2S, R3W, Sec. 28	U420	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Karren Industrial Park	Industrial	Directly south of the City of Roosevelt municipal boundary, Utah	–	20 acres	20	▪ Area in the project boundary considered as the development area since this industrial park is not fully developed	Duchesne County 2009
–	Kelly R. Kielbasa subdivision	Residential subdivision	T4S, R3W, S16	–	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Lake Pointe Ranches subdivision	Residential subdivision	T3S, R5W, Sec. 16	–	323 acres	323	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Lake Side Acres - Grant Starvation subdivision	Residential subdivision	T3S, R5W, Sec. 11	–	158 acres	158	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014

TABLE 4-1
PAST AND PRESENT ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
–	Lane Yack subdivision	Residential subdivision	T2S, R1W, Sec. 33 T3S, R1W, Sec.4	–	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Lazy JP Ranchettes subdivision	Residential subdivision	23 miles west of Duchesne, Utah	U426	70 acres	70	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Ledge Rock Cove subdivision	Residential subdivision	6 miles west of Roosevelt, Utah	–	36 acres	36	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Leon Clayburn subdivision	Residential subdivision	T3S, R3W, Sec. 35	–	81 acres	81	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Lobo Ranchettes subdivision	Residential subdivision	20 miles northeast of Price, Utah	–	368 acres	368	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Luther – Deluca subdivision	Residential subdivision	T3S, R6W, Sec. 6	–	149 acres	149	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Mark Thacker subdivision	Residential subdivision	T2S, R3W, Sec. 15	–	80 acres	80	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Mike Kendall subdivision	Residential subdivision	T2S, R5W, Sec. 34	–	119 acres	119	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Mitchell Minor subdivision	Residential subdivision	T2S, R3W, Sec. 16	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Moondance Ranch Phase I and II subdivision	Residential subdivision	6 miles southeast of Duchesne, Utah	U430, U431	4,162 acres	4,162	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Moonlake Electric	Utility	T3S, R4W, Sec. 16	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	MM70 subdivision	Residential subdivision	T3S, R7W, Sec. 29	–	316 acres	316	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Neal Potter subdivision	Residential subdivision	T3S, R1W, Sec. 4	U410	158 acres	158	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Nicole O'Driscoll subdivision	Residential subdivision	T3S, R2W, Sec. 4	–	41 acres	41	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
Newfield Company	North Lateral PI	Oil and/or gas Development	T3S, R2W, Sec. 14	–	81 acres	81	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
Newfield Company	Gregory Huffman	Pipeline	T3S, R1W, Sec. 18	–	119 acres	119	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Oliver Squire subdivision	Residential subdivision	T3S, R1W, Sec. 7	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Pheasant Run subdivision	Residential subdivision	3 miles southwest of Roosevelt, Utah	–	13 acres	13	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Private Estates subvision	Residential subdivision	T3S, R4W, Sec. 4	–	41 acres	41	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Ranches at Pinion Ridge subdivision	Residential subdivision	T3S, R7W, Sec. 28	–	159 acres	159	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Randall Hanberg subdivision	Residential subdivision	T4S, R3W, Sec. 10	–	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Richard and Connie Johnson subdivision	Residential subdivision	T3S, R9W, Sec. 14	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	River Bend Estates subdivision	Residential subdivision	T2S, R5W, Sec. 34	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	River Breeze Estates subdivision	Residential subdivision	5 miles north of Duchesne, Utah	U420	32 acres	32	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	River Heights Estates subdivision	Residential subdivision	T2S, R5W, Sec. 34	–	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Robbers Roost subdivision	Residential subdivision	25 miles west of Duchesne, Utah	–	80 acres	80	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Ron and Lori Winterton subdivision	Residential subdivision	T2S, R1W, Sec. 30	–	159 acres	159	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Ron Peatross subdivision	Residential subdivision	T2S, R2W, Sec. 23	–	80 acres	80	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014

TABLE 4-1
PAST AND PRESENT ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
–	Rosalinda Park subdivision	Residential subdivision	4 miles north of Duchesne, Utah	–	24 acres	24	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Silver Moon subdivision	Residential subdivision	5 miles southeast of Duchesne, Utah	U430, U431	6,443 acres	6,443	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Squire subdivision	Residential subdivision	T3S, R1W, Sec. 7	–	80 acres	80	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Starvation Ranches II subdivision	Residential subdivision	T3S, R6W, Sec. 35	–	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Sundown Ridge subdivision	Residential subdivision	26 miles west of Duchesne, Utah	U426	141 acres	141	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Sunrise Estates subdivision	Residential subdivision	4 miles southwest of Roosevelt, Utah	–	21 acres	21	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Tabby Shadows subdivision	Residential subdivision	15 miles west-northwest of Duchesne, Utah	U421	659 acres	659	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Taylor subdivision	Residential subdivision	T3S, R2W, Sec. 6	U430	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Thomas Winterton subdivision	Residential subdivision	T2S, R1W, Sec. 29	–	80 acres	80	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Trent Jenkins subdivision	Residential subdivision	T2S, R1W, Sec. 28	–	161 acres	161	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Tuck Away Storage	Commercial	T2S, R1W, Sec. 31	–	41 acres	41	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Uintah Haven subdivision	Residential subdivision	5 miles north of Duchesne, Utah	U420	50 acres	50	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Uintah Mountain Vista subdivision	Residential subdivision	T2S, R2W, Sec. 36	–	159 acres	159	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Uintah View Ranches subdivision	Residential subdivision	1 mile north of Duchesne, Utah	–	2,511 acres	2,511	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Valle Del Padre subdivision	Residential subdivision	25 miles west of Duchesne, Utah	–	441 acres	441	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Victory Pipeline	Water pipeline	Duchesne County	U410, U430	746 acres	746	▪ For this pipeline, the shapefile boundary provided by Jones and DeMille Engineering was used	Jones and DeMille Engineering 2013
–	View subdivision	Residential subdivision	2 miles south of Roosevelt, Utah	–	12 acres	12	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Vista Valley subdivision	Residential subdivision	18 miles west of Duchesne, Utah	U421, U425	768 acres	768	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Vonsville subdivision	Residential subdivision	1 mile south of Roosevelt, Utah	–	157 acres	157	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Warren Brandow subdivision	Residential subdivision	T3S, R8W, Sec. 30	–	76 acres	76	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Wasatch Meadow subdivision	Residential subdivision	26 miles west of Duchesne, Utah	–	69 acres	69	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	West Star Properties	Residential subdivision	20 miles west of Duchesne, Utah	U421	79 acres	79	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
–	Willis Hansen subdivision	Residential subdivision	T3S, R1W, Sec. 9	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2014
–	Young Meadows subdivision	Residential subdivision	20 miles west of Duchesne, Utah	–	934 acres	934	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Duchesne County 2009
Emery County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Grand County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								

TABLE 4-1
PAST AND PRESENT ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
Juab County								
–	Birch Creek subdivision	Residential subdivision	Adjacent to Nortonville of Juab County, 6 miles north and west of Nephi, Utah	–	13 acres	13	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
–	Burraston View subdivision	Residential subdivision	Adjacent to Old Highway 91, and Burraston Hill of Juab County, 6 miles north and west of Nephi, Utah	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
–	Burraston Hill of Juab subdivision	Residential subdivision	Adjacent to Burraston View and Old Highway 91, 6 miles north and west of Nephi, Utah	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
–	Majestic Estates subdivision	Residential subdivision	6 miles north and west of Nephi, Utah	–	7 acres	7	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
–	Nortonville subdivision	Residential subdivision	Adjacent to Birch Creek, 6 miles north and west of Nephi, Utah	–	13 acres	13	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
–	Old 91 subdivision	Residential subdivision	Adjacent to Burraston View, and Burraston Hill of Juab County, 6 miles north and west of Nephi, Utah	–	40 acres	40	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
–	West Creek of Juab subdivision	Residential subdivision	6 miles north and west of Nephi, Utah	–	26 acres	26	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
Nephi City								
–	Deer Acre Plat 'B' subdivision	Residential subdivision	Eastern edge of the municipal boundary of Nephi, Utah	–	6 acres	6	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Juab County 2009
Sanpete County								
–	Mount Baldy subdivision	Residential subdivision	7 miles northeast of Fountain Green, Utah	–	307 acres	307	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Sanpete County 2009
Uintah County								
Enefit American Oil	Shale development	Oil shale and/or tar sand development	In the Uinta Basin, south of Vernal, Utah	–	305 acres	305	▪ Entire project boundary considered since development at this point is unknown	Stantec Corporation 2012
Utah County								
–	Solider Summits residential estates	Residential subdivision	13 miles north of Scofield, Utah	U527, U530, U560	811 acres	811	▪ Area in the project boundary considered as the development area since this subdivision is not fully developed	Utah County 2009
Wasatch County								
There are not any actions identified or data received to be used in cumulative analysis								
Additional Actions[6]								
LANDFIRE™								
–	–	–	Throughout the Project area	–	–	–	**LANDFIRE™** data based on the following attributes: Agriculture-Cultivated Crops and Irrigated Agriculture: Value = 82 Agriculture-Pasture and Hay: Value = 81 Developed-High Intensity: Value = 24 Developed-Medium Intensity = Value 23 Developed-Roads = Value 25 Developed-Upland Deciduous Forest = Value 13 Developed-Upland Evergreen Forest = Value 14 Developed-Upland Herbaceous = Value 16 Developed-Upland Mixed Forest = Value 15 Developed-Upland Shrubland = Value 17 National Agricultural Statistics Service (NASS)-Close Grown Crop = Value 65 NASS-Fallow/Idle Cropland = Value 66 NASS-Orchard = Value 60 NASS-Row Crop = Value 64 NASS-Row Crop-Close Grown Crop = Value 63 Quarries-Strip Mines-Gravel Pits = Value 32	LANDFIRE 2012

TABLE 4-1
PAST AND PRESENT ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
							Recently Disturbed Developed Upland Deciduous Forest = Value 2541 Recently Disturbed Developed Upland Evergreen Forest = Value 2542 Recently Disturbed Developed Upland Herbaceous = Value 2544 Recently Disturbed Developed Upland Mixed Forest = Value 2543 Recently Disturbed Developed Upland Shrubland = Value 2545 Recently Disturbed Orchard Vegetation = Value 2548 Recently Disturbed Pasture and Hayland = Value 2549	
Transmission Line								
–	–	Transmission line	Throughout the Project area	–	–	–	Transmission lines based on averaging corridor widths estimated by 2011 and 2012 NAIP aerial imagery interpretation (NAIP 2011b): 500kV transmission lines: 225-foot-wide corridor 345kV transmission lines: 150-foot-wide corridor 230kV transmission lines: 100-foot-wide corridor 138kV transmission lines: 75-foot-wide corridor 115kV transmission lines: 50-foot-wide corridor	POWERmap Platts 2009
Pipelines								
–	–	Pipeline	Throughout the Project area	–	–	–	Pipelines based on averaging corridor widths estimated by 2011 and 2012 NAIP aerial imagery interpretation (NAIP 2011a): 30- to 42-inch-diameter pipelines: 300-foot-wide corridor 20- to 26-inch-diameter pipelines: 200-foot-wide corridor 10- to 18-inch diameter pipelines: 100-foot-wide corridor 6- to 8.6-inch diameter pipelines: 50-foot-wide corridor	PennWell 2011
Highways/Roads								
–	–	Transportation	Throughout the Project area	–	–	–	Highways and roads is based on averaging corridor widths estimated by 2011 and 2012 NAIP aerial imagery interpretation (NAIP 2011d): Interstate highways: 75-foot-wide corridor Intra-state/Intra-metro Area/Inter-metro Area: 50-foot-wide corridor City/County/Local: 25-foot-wide corridor	Automated Geographic Reference Center 2012
Railroads								
–	–	Transportation	Throughout the Project area	–	–	–	Railroads assume an average corridor width of 25 feet based on 2011 and 2012 NAIP aerial imagery interpretation(NAIP 2011d)	

NOTES:

[1] All locations are approximate unless township/range/section is provided.

[2] The acreage and mileage is calculated from the available data received from agencies or digitized maps. The total acreage is based on the data boundary received from an agency and may not directly reflect what is described in the project description.

[3] The assumptions were used in the quantification portion of the cumulative analysis to achieve an approximate amount of disturbance for each activity.

[4] Additional activities are datasets of existing development but are not called out as individual projects.

[5] The development assumption for transmission lines is based on averaging corridor widths estimated by aerial interpretation for the following voltages:

- 500kV Transmission Lines: 225-foot-corridor
- 345kV Transmission Lines: 150-foot-corridor
- 230kV Transmission Lines: 100-foot-corridor
- 138kV Transmission Lines: 75-foot-corridor
- 115kV Transmission Lines: 50-foot-corridor

Rural residential development, farming, grazing, private airstrips, transportation, and mining claims are dispersed throughout the Project area; however, data inventory for these categories was limited to the 2-mile-wide alternative route study corridors.

During the analysis, a few past and present actions were identified for which data either have not been received from the field offices or were received after analysis began and will be added between the Draft and Final EIS. These past and present actions include:

- Little Snake Field Office
  - Sand Wash Artillery Range Site and Craig Range National Guard Training Site
- Six County Coalition
  - Uinta Basin Rail Study

TABLE 4-2
REASONABLY FORESEEABLE FUTURE ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
Multi-state Actions								
Bureau of Land Management (BLM) Wyoming State Office								
TransWest Express, LLC	TransWest Express 500kV Transmission Project	Transmission line	Begins near Sinclair, Wyoming, and terminates near Las Vegas, Nevada, with possible alternative routes proposed in Colorado and Utah	W102, W107, W108, W110, W111, W113, W117, W120, W124, W409, W410, C100, C101, C105, C106, C13, C175, C177, C185, C186, C195, C196, C197, C270, C92, C93, C94, C95, U241, U310, U406, U407, U408, U409, U410, U411, U418, U420, U421, U424, U425, U426, U429, U430, U431, U432, U433, U434, U435, U436, U437, U438, U439, U442, U443, U445, U486, U487, U488, U489, U490, U496, U498, U502, U504, U511, U512, U513, U515, U523, U524, U525, U527, U530, U533, U537, U540, U545, U546, U548, U560, U585, U586, U587, U600, U625, U629, U630, U631, U636, U639, U650, U728, U729, U730, U731, U732, U733, U734	2,551 miles	77,182	▪ Centerline buffered for a 250-foot-wide right-of-way based on information in the right-of-way application submitted in 2010 (TransWest Express LLC 2010)	AECOM 2013
Bureau of Land Management Rock Springs and Little Snake Field Offices								
Questar Exploration and Production Company, Wexpro Company, and other natural gas development companies	Hiawatha Regional Energy Development Project	Oil and/or gas development	Northwest Colorado/southwest Wyoming	–	158,114 acres	7,552	▪ 1.9 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the public scoping announcement in 2006	BLM 2006c
Wyoming								
Federal								
Bureau of Land Management Rawlins Field Office								
Ambre Energy	Anadarko Rosebud Mine	Coal mine	Northeast of Hanna, Wyoming	W22	12,644 acres	12,644	▪ Area in the project boundary considered as the development area since development at this point is unknown.	Ambre Energy 2012b
BP (consortium)	Continental Divide-Creston Natural Gas Project	Oil and/or gas development	25 miles west of Rawlins, Wyoming, in Carbon and Sweetwater counties	W101, W102, W107, W108, W109, W110, W111, W116, W117, W120, W125, W128, W27, W32	1,028,334 acres	66,723	▪ 2.6 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Project Draft EIS and Plan of Development 2012 (BLM 2012ap)	BLM 2007e
–	Whirlwind I	Wind-energy facility	2 miles southwest of Rawlins, Wyoming	W30, W32	42,568 acres	255	▪ 1.0 acres of disturbance per turbine pad and a density of 1 turbine pad per 167 acres ▪ Based on averaging wind-turbine pad sizes for existing projects in the project area ▪ Developed by evenly spacing 300 turbines in the project-area boundary ▪ Source of this information is from BLM National Environmental Policy Act (NEPA) Hotsheet released in January 2013 and reviewing the National Agricultural Information Program (NAIP) 2012 aerial imagery (BLM 2013o)	BLM 2013p
Bureau of Land Management Rock Spring Field Office								
Evergreen Wind Power Partners, LLC	Quaking Aspen Mountain	Wind-energy facility	Southeast of Rock Springs, Wyoming	–	7,172 acres	109	▪ 1.0 acre of disturbance per turbine pad and a density of 1 turbine pad per 65 acres ▪ Based on averaging wind-turbine pad sizes for similar existing	BLM 2012aq

TABLE 4-2
REASONABLY FORESEEABLE FUTURE ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
							wind projects in the Project area ▪ Density was developed by evenly spacing 79 turbines in the project-area boundary ▪ Source of this information from the scoping notice extension in 2011 (BLM 2011m)	
Sweeney Ranch Wind Park, LLC	Sweeney Ranch	Wind-energy facility	9 miles south of Thayer Junction, Wyoming	–	12,097 acres	329	▪ 1.0 acre of disturbance per turbine pad and a density of 1 turbine pad per 36 acres ▪ Density developed by evenly spacing 150 turbines in the project area boundary ▪ Source of this information is the BLM NEPA Hotsheet, January 2013 (BLM 2013m)	BLM 2009f
Teton Wind, LLC	White Mountain Wind Farm	Wind-energy facility	Located west-northwest of Rock Springs, Wyoming (T19N, R105-106W T20N, R105-106W)	–	13,165 acres	191	▪ 0.8 acres of disturbance per turbine pad and a density of 1 turbine pad per 54.85 acres ▪ Density developed by evenly spacing 240 turbines in the project area boundary ▪ Source of this information from the Environmental Assessment (EA) in 2010 (BLM 2010k)	BLM 2012aq
State								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Local								
Carbon County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Sweetwater County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Colorado								
Federal								
Bureau of Land Management Grand Junction Field Office								
–	–	Oil and/or gas development	20 miles northwest of De Beque, Colorado	–	23,682 acres	228	▪ 1.5 acres of disturbance per well pad and a density of 1 well pad per 160 acres ▪ Based on information in the Reasonable Foreseeable Development Scenario for Oil and Gas, Grand Junction Field Office 2012 (BLM 2012ab)	BLM 2012ab
Bureau of Land Management Little Snake Field Office								
Tri-State Generation and Transmission Association, Salt River Project Agricultural Improvement and Power District, Platte River Power Authority, and PacifiCorp	Trapper Mine	Coal mine	Southwest of Craig, Colorado, east of Colorado State Highway 13	–	10,186 acres	10,186	▪ For this surface mine, the entire area in the project boundary considered as the development area since the extent of the development at this point is unknown	Trapper Mining, Inc. 2012
–	–	Oil and/or gas development	9 miles southeast of Moffat, Colorado	–	11,974 acres	1,205	▪ 4 acres of disturbance per well pad and a density of 1 well pad per 40 acres ▪ Based on information in the Reasonable Foreseeable Development: Oil and Gas in the Little Snake Field Office Administrative Boundary Area, 2004 (BLM 2004b)	BLM 2012ab
Bureau of Land Management White River Field Office								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
							▪	
State								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Local								
Garfield County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Mesa County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								

TABLE 4-2
REASONABLY FORESEEABLE FUTURE ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
Moffat County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Rio Blanco County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Routt County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Utah								
Federal								
Bureau of Land Management Fillmore Field Office								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Bureau of Land Management Moab Field Office								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Bureau of Land Management Price Field Office								
–	Woodside Site	Power generation	Boundary encompasses 50 miles around Green River and East Carbon, Utah	U488, U489, U734	50,046 acres	50,046	▪ Area in the project boundary considered as the development area since development at this point is unknown ▪ Woodside substation is 6.5 acres	BLM 2012ar
Bureau of Land Management Richfield Field Office								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Bureau of Land Management Salt Lake Field Office								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Bureau of Land Management Vernal Field Office								
Moon Lake Electric	Bonanza to Upalco 138kV Transmission Line	Transmission Line	Begins 0.8 mile southeast of Fort Duchesne and runs east for 4.8 miles	–	4.8 miles	88	▪ Based on information from Moon Lake Electric Company (2013)	Moon Lake Electric 2013
Newfield Corporation	Monument Butte EIS	Oil and/or gas development	T8S, R15E, Sec. 24-26, 35, 36 T8S, R16E, Sec. 13-15, 19-36 T8S, R17E Sec. 14-36 T8S, R18E Sec. 19-21, 25-36 T8S, R19E, Sec. 31,32 T9S, R19E, Sec. 4-9, 17-20 T9S, R18E, Sec. 1-35 T9S, R16-17E, all sections T9S, R15E, Sec.1-3, 10-12, 13-15, 22-24, 25-27, 34-36	–	119,669 acres	7,213	▪ 1.2 acres of disturbance per well pad and a density of 1 well pad per 20 acres ▪ Based on information in the Newfield Master Development Plan No. 6 EA, 2011 (BLM 2011n)	BLM 2012aj
Ashley National Forest								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Manti-La Sal National Forest								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Uinta-Wasatch-Cache National Forest								
–	Squaw Creek Road Relocation Project	Highway/Road	Between Spanish Fork Road and Heber-Kamas Road	–	5 miles	12	▪ Road centerline buffered for a 30-foot-wide corridor based on the portion of existing road alignment the project follows (USFS 2012i)	USFS 2012j
Uinta Express Pipeline Company	Uinta Express Pipeline – East Canyon Route	Pipeline	Begins 9.7 miles south of Myton, Utah, and ends 2 miles northwest of Salt Lake City, Utah	U420, U430	150 miles	1,819	▪ 50-foot wide to 100-foot-wide corridor created by buffering the pipeline’s centerline according to the description of the permanent right-of-way in the Uinta Basin Express Pipeline Public Scoping letter (Uinta-Wasatch-Cache National Forest, January 2014)	USFS 2013e
Bureau of Reclamation								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
State								
State of Utah School and Institutional Trust Lands Administration (SITLA)								
	Santaquin Residential, Utah County	Residential	1.6 miles northwest of Rocky Ridge, Utah	–	566 acres	566	▪ Entire project lease boundary considered since development in each lease or project area currently is unknown	SITLA 2013b

TABLE 4-2
REASONABLY FORESEEABLE FUTURE ACTIONS

Applicant	Project Name	Type of Action	General Location[1]	Links Crossing the Action	Approximate Size of Action[2]	Ground Disturbance (acres)	Development Assumptions for Analysis[3]	Source of Alignments or Boundaries
Local								
Carbon County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
City of Helper								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Daggett County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Duchesne County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Emery County								
–	Blue Castle Nuclear Power Plant Project	Power generation	4 miles west-northwest of Green River, Utah	–	1,030 acres	1,030	▪ Area in the project boundary considered as the development area since development at this point is unknown	Emery County 2009a
–	–	Wind-energy facilities	20 miles east of Castle Dale, Utah	–	3,838 acres	3,838	▪ Area in the project boundary considered as the development area since development at this point is unknown	Emery County 2009b
Grand County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Juab County								
–	Juab County Loop Road	Highway/road	West of Mona, Utah	–	3.8 miles	34	▪ Road centerline buffered for a 75-foot-wide corridor based on the average road width for an interstate ▪ Average identified by EPG staff after measuring existing interstates	BLM 2012as
Nephi City								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Sanpete County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Uintah County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
City of Naples								
–	Proposed Golf Course (private)	Recreation	2 miles east of Naples, Utah	–	433 acres	433	▪ Area in the project boundary considered as the development area since development at this point is unknown	Naples City 2009a
Utah County								
No actions have been identified or no data have been received to use in the cumulative effects analysis.								
Wasatch County								
–	Strawberry Highlands subdivision	Residential subdivision	30 miles west of Duchesne, Utah	–	1,906 acres	1,906	▪ Area in the project boundary considered as the development area since the subdivision development at this point is unknown	Wasatch County 2013

NOTES:

[1] All locations are approximate unless township/range/section is provided.

[2] The acreage and mileage is calculated from the available data received from agencies or digitized maps.

[3] The assumptions were used in the quantification portion of the cumulative analysis to achieve an approximate amount of disturbance for each action.

During the analysis, some known reasonably foreseeable future actions in the Project area were identified for which spatial data either have not been received from the field office or forest or was unavailable due to the project being in the early stages of development. These reasonably foreseeable future actions include:

- Multi-State Projects
  - LS Power and Wyoming Infrastructure Authority Wyoming-Colorado Intertie Transmission Project
  - High Plains Express Transmission Project
  - Regional Watershed Supply Project Pipeline
- BLM Rawlins Field Office
  - Catalina Plans of Development, G & I Proposed Atlantic Rim Natural Gas Wells
  - DKRW Facility and pipeline
  - Intermountain Wind (Boswell Springs)
  - Samson Endurance Northern Access Loop Pipeline
- BLM Moab Field Office
  - Professor Valley Land and Water Conservation Fund Site Land Purchase
- BLM Richfield Field Office
  - May 2013 Oil and Gas lease
  - Surface Transportation Board
- Uinta Basin Rail Project
- Duchesne County
  - Source gas pipeline
  - Myton to Wellington pipeline

TABLE 4-3
SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS

Resource or Resource Issue	Issue(s) for Analysis	Cumulative Impact Analysis Area		Methods of Analysis	
		Geographic Scope	**Temporal Scope**	**Quantitative**	**Qualitative**
Climate and Air Quality	▪ What are the cumulative effects of the Project, other present and past projects, and reasonably foreseeable future actions (RFFA) on air quality?	Local airshed	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Assess nature and extent of cumulative effects associated with emissions during construction and operation phases of the of the Project, other present and past projects, and RFFAs
Geologic Hazards	▪ What are the impacts of the Project, other present and past projects, and RFFAs on areas with geological hazards?	The geographical extent of geologic hazards crossed by the 2-mile-wide study corridors	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs to assess potential effects on geologic hazards by (1) physiographic province and (2) areas of flooding and landslide susceptibility	None
Soil Resources	▪ What are the impacts of the Project, other present and past projects, and RFFAs on soils, including erosion on steep slopes as a potential result of ground disturbance?	The geographical extent of soil units crossed by 1-mile from either side of the reference centerline of alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of development associated with the Project, other present and past projects, and RFFAs to assess potential impacts on soils susceptible to wind/water erosion and prime farmland	None
Mineral Resources	▪ What are the impacts of the Project, other present and past projects, and RFFAs on existing land uses and future land uses (including minerals operations)?	2-mile-wide study corridors	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs to assess potential effects on mineral resources with regards to conflicting with the development of a mineral resource	None
Paleontological Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on paleontological resources?	Geographic extent of geological formations crossed by 2-mile-wide study corridors	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Assess cumulative ground disturbance by geologic formation
Water Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • surface water quality; • wetlands, riparian areas, and associated water quality; • other areas susceptible to erosion and potential for associated sediment deposition into water resources?	8-digit hydrologic unit code (HUC) (subbasin) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Analyze potential impacts on surface water quality and potential impacts on wetlands and riparian areas by estimating extent of potential cumulative loss of water resources as well as wetlands and riparian areas associated with the Project, other present and past projects, and RFFAs	Assess potential cumulative impacts on water resources particularly valuable or susceptible to ground-disturbing activities (e.g., specially designated waters, wetlands and riparian areas, perennial systems) Assess potential cumulative impacts on areas with high potential for discharging erosion-related sediment into water resources (i.e., areas particularly susceptible to erosion) Assess potential contribution to existing cumulative impacts on water resources from wildfire and vegetation management actions
Vegetation	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • the spread of noxious weeds; and • wetland and riparian areas?	12-digit HUC (subwatershed) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of potential cumulative loss of vegetation cover associated with the Project, other present and past projects, and RFFAs by community; existing vegetation cover by community estimated by summarizing Gap analysis	Assess potential cumulative impacts on vegetation associated with the spread of noxious weeds Assess potential contribution to existing cumulative impacts on vegetation resources from wildfire and vegetation management actions.
Special Status Plants	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on sensitive plant populations and potential habitats?	Areas of potentially suitable habitat and known populations in 12-digit HUC (subwatershed) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in special status plant species population areas or potential habitats associated with the Project, other present and past projects, and RFFAs for species with available agency or modeled data	Assess potential cumulative impacts on special status plant species populations or potential habitats for species without available agency or modeled data Assess potential contribution to existing cumulative impacts on special status plant resources from wildfire and vegetation management actions

TABLE 4-3
SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS

Resource or Resource Issue	**Issue(s) for Analysis**	**Cumulative Impact Analysis Area**		**Methods of Analysis**	
		Geographic Scope	**Temporal Scope**	**Quantitative**	**Qualitative**
Wildlife	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on big game crucial and severe habitat and migratory bird species, including: anthropogenic development on migratory birds?	**Big game**: Areas of mapped crucial or seasonally important habitat in herd units (i.e., hunt units in Wyoming, game management units in Colorado, and herd units in Utah) crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in mapped crucial (Utah and Wyoming) and severe (Colorado) big game habitat	Assess potential cumulative impacts on mammals and reptiles that may inhabit the project area Assess potential contribution to existing cumulative impacts on wildlife resources from wildfire and vegetation management actions
Special Status Wildlife	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on special status wildlife species, including: • loss of special status species habitat; and • long-term sustainability of populations?	Defined in collaboration with Biological Resources Task Group for each species or species group (Section 4.3.8)	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in special status species habitat (for species with available agency or modeled data)	Assess potential cumulative impacts on long-term sustainability of special status populations by species group (for species without available agency or modeled data) Assess potential contribution to existing cumulative impacts on special status wildlife resources from wildfire and vegetation management actions
Migratory Birds	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: ▪ Sensitive migratory bird species ▪ Areas identified as important to migratory bird conservation ▪ Migratory bird habitat	**Migratory birds**: the Project area, and its contribution as a part of the Central and Pacific migratory flyways **Conservation areas**: the Project area **Migratory bird habitat**: Vegetation communities in 12-digit HUC (subwatershed) drainage areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Habitat loss is discussed in the context of its impacts on migratory birds, but is quantitatively analyzed by reference to the Vegetation analysis. No other cumulative impacts are quantified.	Assess potential cumulative impacts on migratory birds related to direct impacts (mortality, disturbance) and indirect impacts (habitat alteration and fragmentation) Assess potential contribution to existing cumulative impacts on migratory birds from wildfire and vegetation management actions
Fish and Aquatic Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • Federally listed threatened, endangered, proposed and candidate fish; • Bureau of Land Management, U.S. Forest Service, and state-listed special status fish and aquatic species; and • game fish and other aquatic organisms?	8-digit HUC (subbasin) drainage areas crossed by alternative routes	10 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Assess potential cumulative impacts on critical habitats or known locations of special status species effects from the Project, other present and past projects, and RFFAs within 1 mile upstream; resources are grouped by watershed in the discussion
Land Use Resources	▪ What conflicts does the Project, other present and past projects, and RFFAs pose with existing land uses or land management objectives (agricultural, recreational, conservation)? ▪ What are the impacts of the Project, other present and past projects, and RFFAs on existing land uses and future lands uses (planned development)?	2-mile-wide study corridors	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of potential land-use conflicts associated with the Project, other present and past projects, and RFFAs	None
Parks, Preservation, and Recreation	▪ What are the impacts of the Project, other present and past projects, and RFFAs on recreational uses and areas?	Boundary of recreation resources crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of potential recreation resource or resource use conflicts associated with the Project, other present and past projects, and RFFAs	None
Transportation and Access	▪ What are the impacts of the Project, other present and past projects, and RFFAs on airports and landing strips, roadways and railroads?	2-mile-wide alternative route study corridors	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate the extent of potential conflicts with transportation and access associated with the Project, other present and past projects, and RFFAs	None
Congressional Designations	▪ What are the impacts of the Project, other present and past projects, and RFFAs on congressional designations	Boundary of congressional designation areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in congressional designation area potentially crossed by the Project	None

TABLE 4-3
SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS

Resource or Resource Issue	Issue(s) for Analysis	Cumulative Impact Analysis Area		Methods of Analysis	
		Geographic Scope	**Temporal Scope**	**Quantitative**	**Qualitative**
Special Designations and Other Management Areas	▪ What are the impacts of the Project, other present and past projects, and RFFAs on special designations and other management areas?	Boundary of special designations or other management areas crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in special designations or other management areas potentially crossed by the Project	Evaluate potential cumulative effects on the relative or important values for which the area was designated
Lands with Wilderness Characteristics	▪ What are the impacts of the Project, other present and past projects, and RFFAs on lands with wilderness characteristics, natural areas, or lands with wilderness characteristics adopted into a BLM resource management plan (RMP)?	Boundary of lands with wilderness characteristics, natural area, or lands with wilderness characteristics adopted into a BLM RMP crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in natural areas or lands with wilderness characteristics adopted into a BLM RMP potentially crossed by the Project	Evaluate potential cumulative impacts on wilderness criteria inventoried on lands with wilderness characteristics
U.S. Forest Service Inventoried Roadless Areas (IRAs) and Unroaded/Undeveloped area	▪ What are the impacts of the Project, other present and past projects, and RFFAs on IRAs and Unroaded/Undeveloped areas?	Boundary of IRA or unroaded/ undeveloped area boundary crossed by alternative routes	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	Estimate extent of development associated with the Project, other present and past projects, and RFFAs in IRAs or Unroaded/Undeveloped areas potentially crossed by the Project	Evaluate potential cumulative impacts on wilderness characteristics and/or roadless characteristics
Visual Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • scenery; and • views from residences and other viewing areas (e.g., travel routes, recreation areas, and special designations)?	**Scenery**: Scenic Quality Rating Units (SQRU) that would be fully or partially located within 3 miles of the alternative routes were considered **Viewers**: Defined by the agency-approved simulation locations that would have views of the Project and of the TransWest Express and/or Gateway West transmission projects, where the projects could be colocated	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	**Scenery**: Estimate extent of development associated with the Project, other present and past projects, and RFFAs in each SQRU (total area of development in the SQRU and a percentage of the SQRU) **Viewers**: Illustrate potential cumulative impacts on viewers at 32 key observation points using visual simulations	**Scenery**: For key SQRUs, assess cumulative effects on landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification as appropriate
National Trails System	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on National Scenic and Historic Trail's resources, qualities, values, associated settings, or primary use(s)?	**National Scenic Trails:** Extent of trail alignment located in BLM Field Offices traversed by the Project **National Historic Trails:** High potential route segments and high potential historic sites for congressionally-designated trails, or feasibility study alignments for trails under study, adjacent to the Project	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Evaluate potential cumulative effects on National Scenic and Historic Trail resources, qualities, values, associated settings, or primary use(s)
Cultural Resources	▪ What are the cumulative effects of the Project, other present and past projects, and RFFAs on: • archaeological and historic sites; • cultural resources dependent on visual settings (e.g., national historic trails); and • traditional cultural properties?	4-mile-wide study corridor as defined by Cultural Resources Task Group	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None. Effects on cultural resources are highly dependent on unknown site-specific conditions that may change substantially over time (i.e., site is destroyed through natural environmental processes; site is destroyed through human causes) and on unknown project-specific conditions (i.e., project engineering)	Assess potential cumulative effects on cultural resources, including the potential for effective mitigation
Wildland and Fire Ecology Management	▪ What contribution would the Project, other present and past projects, and RFFAs have to fire risk caused by ongoing human activities, and how does it contribute to the fire suppression challenges associated with an expanding wildland urban interface?	Project area	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None. Effects on fire ecology and management are highly dependent on unknown site-specific conditions that may change substantially in a single season, and unpredictable temporal conditions (e.g., weather).	Evaluate the potential for any type of ground disturbance associated with the Project, other present and past projects, and RFFAs to facilitate spread of invasive plants, change fire regime. Evaluate existing wildland urban interface and other transmission lines, and whether or not the Project could facilitate or constrain fire management

TABLE 4-3
SUMMARY APPROACH TO CUMULATIVE EFFECTS ANALYSIS

Resource or Resource Issue	Issue(s) for Analysis	Cumulative Impact Analysis Area		Methods of Analysis	
		Geographic Scope	**Temporal Scope**	**Quantitative**	**Qualitative**
Social and Economic Conditions	▪ What are the impacts of the Project, other present and past projects, and RFFAs on local tourism in affected areas? ▪ What is the availability of employment for the local workforce during construction of the Project, other present and past projects, and RFFAs? ▪ Could the Project, other present and past projects, and RFFAs result in disparate impacts on low-income and/or disadvantaged populations? ▪ What are the impacts of Project, other present and past projects, and RFFAs on private property values? ▪ What are the impacts of Project, other present and past projects, and RFFAs on businesses and existing and future economic development?	Project area by county	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Evaluate possible cumulative effects on available workforce, employment, population, housing, and property values
Electric and Magnetic Fields	▪ What are the potential health effects of the Project, other present and past projects, and RFFAs on humans and animals from electric and magnetic fields? ▪ Would the Project, other present and past projects, and RFFAs cause interference with cellular phone, Internet, radio and/or television reception? ▪ What are the other potential cumulative effects of the Project, other present and past projects, and RFFAs on occupational and public safety?	2-mile-wide study corridor where the Project is or could be adjacent to other extra-high-voltage transmission lines	5 years for construction and stabilization; for operation and maintenance, assuming transmission line and ancillary facilities would be for the life of the Project (50 years or longer) and could be permanent if the Project is not decommissioned	None	Evaluate potential for disease or adverse effects from cumulative exposure to electric and magnetic fields and audible noise levels; evaluate potential cumulative effects on occupational health and safety

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TABLE 4-4
DATA COMPONENTS OF EXISTING DEVELOPMENT BASE LAYER

Dataset	Attributes
Two-mile-wide Alternative Route Study Corridors	
Existing Land Use Layer	Air facilities
	Agriculture
	Commercial
	Communication facilities
	Industrial
	Military
	Parks/Preservation
	Public/Quasi public
	Recreation
	Residential
	School/Educational facility
	Transportation (ground)
	Utilities
Utilities–Existing Transmission Lines	Utilities–transmission lines
Utilities–POWER Engineers Pipelines	Utilities–pipelines
ESRI StreetMap Roads™	Ground transportation–roads
Federal Railroad Administration–Railroads	Ground transportation–railroads
Two-mile-wide Alternative Route Study Corridors to the Largest Cumulative Impact Analysis Area	
LANDFIRE™	Agricultural
	Developed
	Recently disturbed
	Agricultural
Utilities–Existing Transmission Lines	Utilities–transmission lines
Utilities–POWER Engineers Pipelines	Utilities–pipelines
ESRI StreetMap Roads ™	Ground transportation–roads
Federal Railroad Administration–Railroads	Ground transportation–railroads

TABLE 4-4
DATA COMPONENTS OF EXISTING DEVELOPMENT BASE LAYER

Dataset	Attributes
Reference Centerlines of Alternative Routes to the Project Area Boundary	
Past and Present Activities	Coal mining
	Historical fires
	Industrial
	Military
	Mineral or other material mining
	Oil shale and/or tar sands
Past and Present Activities	Oil and/or gas development
	Residential
	Sand and gravel mining
	Tar sands
	Vegetation management/Habitat improvement
	Vegetation management/Recreation improvement
	Wind-energy facility

NOTE: Other data layers are available in the existing land-use and LANDFIRE^{TM} datasets. Layers shown in this table have been selected to represent existing development. These layers include the following: Agriculture-Cultivated Crops and Irrigated Agriculture, Agriculture-Pasture and Hay, Developed-High Intensity, Developed-Medium Intensity, Developed-Roads, Developed-Upland Deciduous Forest, Developed-Upland Evergreen Forest, Developed-Upland Herbaceous, Developed-Upland Mixed Forest, Developed-Upland Shrubland, National Agricultural Statistics Service (NASS)-Close Grown Crop, NASS-Fallow/Idle Cropland, NASS-Orchard, NASS-Row Crop, NASS-Row Crop-Close Grown Crop, Quarries-Strip Mines-Gravel Pits, Recently Disturbed Developed Upland Deciduous Forest, Recently Disturbed Developed Upland Evergreen Forest, Recently Disturbed Developed Upland Herbaceous, Recently Disturbed Developed Upland Mixed Forest, Recently Disturbed Developed Upland Shrubland, Recently Disturbed Orchard Vegetation, and Recently Disturbed Pasture and Hayland. Additional LANDFIRE^{TM} data types including Recently Burned Herbaceous Wetlands and Recently Burned-Herb and Grass Cover were not included to represent existing development. Existing transmission lines were compiled according to kilovolt (kV) capacity. Average corridor sizes were estimated by aerial interpretation: 500kV (225-foot-wide corridor); 345kV (150-foot-wide corridor); 230kV (100-foot-wide corridor); 138kV (75-foot-wide corridor); 115kV (50-feet-wide corridor). Pipelines were compiled according to data provided by POWER Engineers. Pipeline sizes vary from 6 inches to 42 inches in diameter. Average visible scar widths were estimated by aerial interpretation to develop average corridors for the following pipeline groups: 30- to 42-inch-diameter pipelines (300-feet-wide corridor); 20- to 26-inch-diameter (200-foot-wide corridor); 10- to 18-inch-diameter (100-foot-wide corridor); and 6- to 8.6-inch-diameter pipelines (50-foot-wide corridor). Roads are compiled according to road type. Average road corridor size was estimated by averaging the following road categories corridor widths using aerial interpretation: Interstate Highway (75-feet-wide corridor); Intra-State/Intra-Metropolitan Area/Inter-Metropolitan Area (50-foot-wide corridor); and City/County/Local (25-foot-wide corridor). Railroad corridors, based on aerial interpretation, were averaged to be 25-feet-wide.

4.3 Cumulative Effects

4.3.1 Climate and Air Quality

The approach for analysis of cumulative effects on air quality, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.1) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.1.1 Issues Identified for Analysis

Air pollutant emissions—including the major regulated criteria pollutants, GHGs, and lesser amounts of other regulated pollutants, such as HAPs—would occur primarily during construction of the transmission line and series compensation stations. During the operations phase, emission sources would be limited to vehicular use for routine maintenance and emergency repair activities. The sources would be similar to those from construction, but pollutants would be emitted in much smaller amounts on an annual basis. Therefore, the majority of emissions and impacts would be associated with construction. In addition, circuit breakers at the series compensation stations would release negligible amounts of SF_6, a GHG, due to leakage over time.

Construction of the transmission line and series compensation stations would release air pollutants from construction sources such as traffic, construction equipment, fugitive dust from earthmoving, etc. These emissions would combine with emissions from other existing local and regional sources of air pollutant to affect ambient concentrations of pollutants. The smaller amounts of pollution released during operation would combine with both existing and future emissions sources to affect ambient pollutant concentrations. GHGs released from Project sources would combined with global GHG emissions to affect climate change.

4.3.1.2 Existing Condition

Tables 3-2, 3-3, and 3-4 detail the current climate in the Project area. Tables 3-5, 3-6, and 3-7 detail the existing air quality.

Most of the area traversed by the alternative routes is in compliance with federal and state ambient air quality standards. The exception is Utah County, Utah, which would be traversed by portions of Alternatives COUT-A, COUT-B, and COUT-C. The entire county is considered a nonattainment area with respect to the NAAQS for PM_{10}.

4.3.1.3 Results

Cumulative ambient effects from the construction phase of the Project and other existing sources of air pollutant emissions have been quantified in Appendix H. The background air-quality concentrations shown are indicative of impacts due to air pollutant emissions from existing sources.

Overall, impacts on air quality from construction would be temporary, localized to the vicinity of the activity, and would disperse or settle. The screening-level air-quality model performed to analyze potential impacts on air quality could not rule out a potential exceedance of the numerical value of the 1-hour standard for NO_2 because of emissions from construction equipment used during transmission line and series compensation station construction (all other projected impacts were within standard limitations). However, current screening-level modeling methodology is inadequate to accurately characterize these impacts. Based on the conservative assumptions used in estimating the concentrations and dispersion of criteria pollutants generated from construction activities, violations of the NAAQS for

NO_2 resulting from Project construction would not be anticipated. In addition, the 1-hour NO_2 NAAQS is based on a 3-year average of submaximum concentrations. The activities resulting in maximum construction emissions would not occur in the same location for multiple years and the model only predicts maximum impacts, not the submaximum impacts that are the basis of the standard.

With respect to RFFAs, the likelihood of overlap with other development impacts is slight because the proposed Project impacts would be temporary and localized. Emissions related to transmission line construction would affect different areas as the construction activity progresses, and series compensation station emissions would only affect the immediate area of the station (maximum impacts occur in a few hundred feet of the construction activities). In addition, transmission line or series compensation station construction emissions—such as dust or emissions from construction equipment that are emitted near ground level—do not produce measurable impacts at regional scales. Project-related traffic would represent a negligible portion of total traffic on public roads.

In addition, most of the reasonably foreseeable projects listed in Table 4-2 also would have air-quality impacts that are primarily related to their construction, rather than operation. This includes wind and solar projects, subdivisions, other transmission lines, pipelines, and substations. Impacts from such projects would be unlikely to overlap in time and space with construction emissions from the proposed Project because they would likewise be temporary and localized.

One activity that would occur with increasing frequency over portions of the Project area that could combine with transmission line and series compensation station construction emissions is oil and gas development. Southwestern Wyoming, northwestern Colorado, and northeastern Utah are all seeing increases in drilling and production. Both southwestern Wyoming and eastern Utah are currently being studied to determine the expected magnitude of emissions and impacts from these activities. Ambient impacts from oil and gas development will likely increase to some extent in future years as development occurs; however, recent EPA regulations on oil and gas production, as well as state-level regulations, are aimed at limiting these increases and preventing ambient standard violations or remedying any existing violations. Again, the localized and temporary nature of Project construction impacts would limit the opportunity for overlap of emissions and impacts.

With respect to GHGs, emissions from construction of the transmission line would range from 108 to 143 tons of CO_2e per mile of transmission line. Total emissions for the Applicant's Preferred Alternative (Alternatives WYCO-B and COUT-C) would total approximately 50,000 tons of CO_2e over the 3 years of Project construction; other alternative routes would emit somewhat more due to longer transmission line distances. Construction of the two series compensation stations would emit an additional 3,000 tons CO_2e each. In contrast, the energy-related CO_2 emissions in the U.S. totaled 6,215 million tons in 2010 (U.S. Energy Information Administration 2011a); energy related CO_2 constitutes approximately 80 percent of total U.S. man-made GHG emissions (U.S. Energy Information Administration 2011b). The maximum annual GHG emissions from Project construction would represent less than 0.001 percent of annual energy-related emissions in the U.S., a minor additional contribution to cumulative emissions.

During operation of the series compensation stations, approximately 50 tons of CO_2e (as SF_6) would be emitted per year. This represents less than 0.000001 percent of annual energy-related emissions in the U.S., a negligible amount.

Because GHG emissions from proposed projects contribute to climate change on a global scale, project-specific impacts of GHG emissions on the local environment cannot be quantified. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. Currently, BLM does not have an established mechanism to accurately predict the effect of resource management-level decisions from this project-specific effort on global climate change. Although the Project would emit GHGs during construction, the emissions would be temporary, only occurring over a period of approximately 3 years. GHG emissions from operation of the series compensation stations would be negligible.

4.3.2 Earth Resources

The approaches for analysis of cumulative effects on geologic hazards, soil resources, and mineral resources, including the geographic and temporal scopes defined for analysis, are presented in Table 4-3. These analyses rely on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.2) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.2.1 Issues Identified for Analysis

4.3.2.1.1 Potential Impacts on Geologic Hazards

Potential cumulative effects on geologic hazards include landslide susceptibility resulting from the loss of vegetation or ground-disturbing activities related to the construction phase of multiple projects in a localized area. Also, mine subsidence could increase above subsurface mining activities in a localized area. Geologic hazards could directly and indirectly affect the construction, operation, and maintenance of the Project, either through direct loss of equipment or injury to personnel as a result of seismic activity, flooding, or landslides or indirect loss of transmission service as a result of these hazards. Cumulative effects of past and present actions and RFFAs are not expected to affect Quaternary faults or flooding.

4.3.2.1.2 Potential Impacts on Soil Resources

Cumulative effects on soil resources can result either from (1) alterations to the natural environment and land surface that could increase the rate of soil erosion by water or wind or (2) the permanent conversion of designated farmland soils to nonagricultural uses that could collectively result in limited loss of productivity of soils with the geographic scope for analysis. The implementation of appropriate selective mitigation measures would minimize short-term impacts, such as disturbance of surface soils and other alternations to the natural environment stemming from construction of the Project, other past and present projects, and RFFAs, such that the local soil resources would be stabilized or returned to a state close to their preconstruction state. Long-term impacts on soil resources would be associated with increased public access via new access roads to previously undisturbed areas crossed by the Project.

4.3.2.1.3 Potential Impacts on Existing Mineral Operations

Mineral resources are associated with the geologic formations or units they are found in. Not all geologic formations contain mineral resources or mineral resources may be found only in a portion of a geologic formation. The addition of the Project to past and present actions and RFFAs could result in greater potential for effects on mineral resources throughout the Project area. The potential direct cumulative effects include ground disturbance, such as grading and cutting of access roads, auguring for tower footings and anchors, and conflicts with the development of mineral resources. Indirect effects include improved access to areas with mineral potential. The types of impacts on mineral resources that could occur with implementation of the Project are discussed in Section 3.2.2.4.2.

4.3.2.2 Existing Condition

4.3.2.2.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Geologic Hazards

Areas of potential mine subsidence are present along all of the WYCO alternative routes and are associated with underground coal mines crossed by the alternative routes. Quaternary faults are present, but rare, along all of the WYCO alternative routes. Areas with moderate potential for flooding are present along all of the WYCO alternative routes along the rivers, streams, and drainages crossed by the alternative routes. Areas with high and moderate potential for landslides are present along all of the WYCO alternative routes and are most common in the steep areas crossed by the Project.

Soil Resources

Soils that are highly susceptible to water erosion are rare along the WYCO alternative routes and soils that are moderately susceptible occur intermittently along all of the alternative routes. Soils that are highly susceptible to wind erosion are rare along the WYCO alternative routes and soils that are moderately susceptible to wind erosion occur intermittently along all of the alternative routes. Designated Prime or Unique Farmland soils are present along all of the WYCO alternative routes and generally are restricted to valleys that are currently actively irrigated in Colorado.

Existing Mineral Operations

Active mines and producing wells are common along all of the WYCO alternative routes. Active mining claims are only present along Alternative WYCO-D. Permitted mines are present along all of the WYCO alternative routes with the greatest past and present development along Alternative WYCO-D. Coal and other leases are present along all of the WYCO alternative routes with the greatest past and present development along Alternative WYCO-D. Oil and gas leases are present along all of the WYCO alternative routes with the greatest past and present development along Alternative WYCO-D. There are no geothermal leases along the WYCO alternative routes.

4.3.2.2.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Geologic Hazards

Areas of potential mine subsidence are present along all of the COUT BAX alternative routes and are associated with underground coal mines crossed by the alternative routes. Quaternary faults are present, but rare, along all of the COUT BAX alternative routes. Areas with moderate potential for flooding are present along all of the COUT BAX alternative routes along the rivers, streams, and drainages crossed by the alternative routes. Areas with high and moderate potential for landslides are present along all of the COUT BAX alternative routes and are most common in the mountainous areas of central Utah crossed by the Project.

Soil Resources

Soils that are highly susceptible to water erosion are most common in the mountainous areas of central Utah and soils that are moderately susceptible occur intermittently along all of the alternative routes. Soils that are highly susceptible to wind erosion are rare along the COUT BAX alternative routes and soils that are moderately susceptible to wind erosion occur intermittently along all of the alternative routes. Designated Prime or Unique Farmland soils are present along all of the COUT BAX alternative routes and generally are restricted to valleys that are currently actively irrigated.

Existing Mineral Operations

Active mines and producing wells are common along all of the COUT BAX alternative routes with the greatest past and present development along Alternative COUT BAX-E. Active mining claims and permitted mines are present, but rare, along all of the COUT BAX alternative routes. Coal and other leases are common along all of the COUT BAX alternative routes with the greatest past and present development along Alternatives COUT BAX-B and COUT BAX-C. Oil and gas leases are common along all of the COUT BAX alternative routes with the greatest past and present development along Alternatives COUT BAX-B and COUT BAX-C. One geothermal lease is present along Alternative COUT BAX-E.

4.3.2.2.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Geologic Hazards

Areas of potential mine subsidence are only present along Alternatives COUT-H and COUT-I. Quaternary faults are present, but rare, along all of the COUT alternative routes. Areas with moderate potential for flooding are present along all of the COUT alternative routes along the rivers, streams, and drainages crossed by the alternative routes. Areas with high and moderate potential for landslides are present along all of the COUT alternative routes are most common in the mountainous areas of central Utah crossed by the Project.

Soil Resources

Soils that are highly susceptible to water erosion are most common in the mountainous areas of central Utah and soils that are moderately susceptible occur intermittently along all of the alternative routes. Soils that are highly susceptible to wind erosion are rare along the COUT alternative routes and soils that are moderately susceptible to wind erosion occur intermittently along all of the alternative routes. Designated Prime or Unique Farmland soils are present along all of the COUT alternative routes and are generally restricted to valleys that are currently actively irrigated.

Existing Mineral Operations

Active mines and producing wells are present along all of the COUT alternative routes with the greatest past and present development along Alternatives COUT-H and COUT-I. Active mining claims are present only along Alternatives COUT-C, COUT-H, and COUT-I. Permitted mines are present, but rare, along all of the COUT alternative routes. Coal and other leases are common along all of the COUT alternative routes but the greatest past and present development occur along Alternatives COUT-H and COUT-I. Oil and gas leases are common along all of the COUT alternative routes with the greatest past and present development along Alternative COUT-I. Geothermal leases are present, but rare, along Alternatives COUT-C, COUT-H, and COUT-I.

4.3.2.3 Results

4.3.2.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes

Geologic Hazards

The WYCO alternative routes do not cross any areas with Quaternary faults. The WYCO alternative routes cross areas with rare occurrences of potential mine subsidence. Cumulative effects from areas with potential mine subsidence on projects would only occur where other projects are sited in the immediate vicinity of the Project.

Soil Resources

Sensitive Soils

Sensitive soils with moderate or high susceptibility to water or wind erosion, would experience the greatest cumulative effects along Alternative WYCO-D; whereas, the least cumulative effects would occur along Alternative WYCO-C (Table 4-5).

TABLE 4-5
SOIL RESOURCES (SENSITIVE SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
WYCO-B (Agency and Applicant Preferred Alternative)	26,415	1,962	3,331	3,079	8,373	18,043
WYCO-C	26,896	2,906	2,577	3,008	8,491	18,405
WYCO-D	31,974	4,254	2,061	3,266	9,581	22,393
WYCO-F	28,025	1,987	3,344	3,116	8,447	10,579

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on sensitive soils include:

- BLM vegetation treatments in the Little Snake Field Office
- BLM oil and gas units in the BLM Price, Richfield, and Vernal Field Offices
- oil and gas leases on Colorado and Utah state lands
- Chokecherry Wind Farm Expansion
- Seven Mile Hill Wind Energy Facility
- Gateway West Transmission Project

RFFAs that would have cumulative effects on sensitive soils include:

- Continental Divide-Creston Junction oil and gas project
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

Designated Farmland Soils

Designated farmland soils would experience similar cumulative effects along all of the WYCO alternative routes (Table 4-6).

TABLE 4-6
SOIL RESOURCES (FARMLAND SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
WYCO-B (Agency and Applicant Preferred Alternative)	18,183	874	586	247	1,707	16,476
WYCO-C	18,183	874	586	247	1,707	16,476
WYCO-D	31,959	7,517	704	274	8,494	23,464
WYCO-F	18,183	874	586	246	1,706	16,477

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on designated farmland soils include oil and gas fields. The RFFA that would have cumulative effects on designated farmland soils is the TransWest Express Transmission Project.

Existing Mineral Operations

Active Mining Claims and Producing Wells

Active mining claims and producing wells are common along the WYCO alternative routes with concentrations in Wyoming (Table 4-7). Cumulative effects on active mines and producing wells would be greatest along Alternatives WYCO-B and WYCO-C, which are similar, and would be the least along Alternative WYCO-D.

TABLE 4-7
MINERAL RESOURCES (ACTIVE MINES AND PRODUCING WELLS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
WYCO-B (Agency and Applicant Preferred Alternative)	13,510	1,731	787	100	2,617	10,893
WYCO-C	12,313	1,651	616	78	2,345	9,968
WYCO-D	8,798	1,446	435	66	1,948	6,850
WYCO-F	14,237	1,763	895	86	2,744	11,493

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would cumulatively affect active mines include:

- Chokecherry Wind Farm Expansion
- Sevenmile Hill Wind Energy Facility
- oil and gas leases on Colorado and Wyoming state lands
- BLM oil and gas units on the White River and Little Snake Field Offices
- Gateway West Transmission Project

RFFAs that would cumulatively affect active mines and producing wells include:

- Continental Divide-Creston Junction oil and gas project
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

Active Mining Claims

Active mining claims are only present along Alternative WYCO-D, and cumulative effects would be associated with reasonably foreseeable future projects (Table 4-8).

TABLE 4-8
MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-D	39	0	2	0	2	37

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Permitted Mines

Permitted mines occur infrequently along the WYCO alternative routes and would experience the greatest cumulative effect along Alternative WYCO-D (Table 4-9).

TABLE 4-9
MINERAL RESOURCES (PERMITTED MINES) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	182	12	2	3	17	165
WYCO-C	234	21	0	0	21	212
WYCO-D	1,180	295	13	1	308	872
WYCO-F	208	13	3	3	19	188

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on permitted mines include the Chokecherry Wind Farm Expansion and BLM oil and gas units on the White River and Little Snake Field Offices. The RFFA that would cumulatively affect permitted mines along the WYCO alternative routes is the TransWest Express Transmission Project.

Coal and Other Leases

Coal and other leases, including uranium, are present to varying degrees along the WYCO alternative routes. Cumulative effects would be greatest along Alternative WYCO-D and would be least along Alternative WYCO-B (Table 4-10).

TABLE 4-10
MINERAL RESOURCES (COAL AND OTHER LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	5,118	2,157	147	29	2,333	2,785
WYCO-C	29,204	2,484	147	55	2,643	26,561
WYCO-D	145,254	7,952	532	117	8,602	136,652
WYCO-F	5,123	2,206	187	29	2,422	2,701

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on coal or other leases include:

- existing coal and uranium leases on Wyoming state lands
- BLM oil and gas units on the White River and Little Snake Field Offices
- oil and gas leases on Colorado and Wyoming state lands
- Chokecherry Wind Farm Expansion
- Gateway West Transmission Project

RFFAs that would have cumulative effects on coal and other leases include:

- Continental Divide-Creston Junction oil and gas project
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

Oil and Gas Leases

Oil and gas leases are present to varying degrees along the WYCO alternative routes (Table 4-11). Cumulative effects would be greatest along Alternative WYCO-D and would be least along Alternative WYCO-B.

TABLE 4-11
MINERAL LEASES (OIL AND GAS LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	251,742	7,198	8,302	1,115	16,614	235,128
WYCO-C	268,734	9,099	7,946	1,086	18,131	250,603
WYCO-D	224,946	15,186	6,371	1,080	22,637	202,309
WYCO-F	255,177	7,695	8,706	821	17,223	237,954

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on oil and gas leases include:

- existing coal leases on Wyoming state lands
- oil and gas leases on Colorado and Wyoming state lands
- BLM oil and gas units on the White River and Little Snake Field Offices
- Chokecherry Wind Farm Expansion
- Gateway West Transmission Project

RFFAs that would have cumulative effects on oil and gas leases include:

- Continental Divide-Creston Junction oil and gas project
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

Potential Mineral Resource Areas

Areas identified as having potential mineral resources are common along the WYCO alternative routes and would experience the greatest cumulative effect along Alternative WYCO-D (Table 4-12).

TABLE 4-12
MINERAL RESOURCES (POTENTIAL MINERAL RESOURCE AREAS) CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	114,687	5,078	5,221	1,283	11,583	103,105
WYCO-C	122,599	6,353	4,905	1,325	12,583	110,017
WYCO-D	171,269	24,530	5,709	1,594	31,834	139,435
WYCO-F	131,966	6,126	6,577	1,341	14,044	117,922

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

4.3.2.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes

Geologic Hazards

The COUT BAX alternative routes cross nearly equal areas of Quaternary faults that would have potential cumulative effects on the Project and other projects. Areas with potential mine subsidence occur infrequently along the COUT BAX alternative routes with the greatest potential along Alternative COUT BAX-E. Cumulative effects from either Quaternary faults or areas with potential mine subsidence on projects would occur only where other projects are sited immediately near the Project.

Soil Resources

Sensitive Soils

Sensitive soils occur along all of the COUT BAX alternative routes, and cumulative effects on sensitive soils would be greatest along Alternative COUT BAX-C and least along Alternative COUT BAX-B (Table 4-13).

TABLE 4-13
SOIL RESOURCES (SENSITIVE SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	34,964	3,107	2,830	3,365	9,301	25,663
COUT BAX-C	36,132	3,519	4,199	3,095	10,813	25,319
COUT BAX-E	36,744	3,477	4,015	3,302	10,794	25,950

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that cumulatively would affect sensitive soils include:

- various mines
- oil and gas wells on BLM lands in the Price, Richfield, and Vernal field offices
- oil and gas wells on Utah state lands
- oil shale leases on Utah state lands
- Carbon County proposed ATV trail

RFFAs that cumulatively would affect sensitive soils include:

- Kerr-McGee oil and gas development
- Narrows proposed East Bench and Oak Creek pipeline
- TransWest Express Transmission Project

Designated Prime or Unique Farmland Soils

Designated Prime or Unique Farmland soils occur along all of the COUT BAX alternative routes and cumulative effects on designated Prime or Unique Farmland soils would be similar along all of the COUT BAX alternative routes (Table 4-14).

TABLE 4-14
SOIL RESOURCES (FARMLAND SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	36,786	11,580	733	328	12,640	24,145
COUT BAX-C	36,786	11,580	733	326	12,638	24,147
COUT BAX-E	39,821	11,298	817	383	12,498	27,323
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Past and present developments that cumulatively would affect designated Prime or Unique Farmland soils include:

- Deserado Mine expansion
- active sand and gravel permits in Utah
- oil and gas leases on BLM land in the Price Field Office, Colorado state lands, and Utah state lands
- Ferron Natural Gas project
- Carbon County proposed ATV trail

RFFAs that cumulatively would affect designated Prime or Unique Farmland soils would include:

- Narrows proposed East Bend and Oak Creek pipeline
- Mona South Transmission Line Project
- TransWest Express Transmission Project

Existing Mineral Operations

Active Mining Claims and Producing Wells

Active mines and producing wells are common along the COUT BAX alternative routes with substantially greater numbers along Alternative COUT BAX-E relative to Alternatives COUT BAX-B and COUT BAX-C (Table 4-15). Cumulative effects on active mines and producing wells would be greatest along Alternative COUT BAX-E.

TABLE 4-15
MINERAL RESOURCES (ACTIVE MINES AND PRODUCING WELLS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	22,666	11,769	409	138	12,315	10,351
COUT BAX-C	22,870	11,727	520	137	12,384	10,486
COUT BAX-E	48,598	33,901	509	168	34,578	14,021
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

Past and present developments that cumulatively would affect active mines and producing wells include:

- existing mines and metalliferous mineral and potash leases on Utah state lands
- BLM oil and gas units on the Grand Junction, Moab, Price, Richfield, Vernal, and White River Field Offices
- Ferron natural gas project
- Enterprise Mid-America pipeline

The RFFA that cumulatively would affect active mines and producing wells is the TransWest Express Transmission Project.

Active Mining Claims

Active mining claims are present along the COUT BAX alternative routes with substantially greater numbers along Alternative COUT BAX-E relative to Alternatives COUT BAX-B and COUT BAX-C (Table 4-16).

TABLE 4-16
MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	660	57	34	20	111	549
COUT BAX-C	660	57	34	20	111	549
COUT BAX-E	1,640	65	47	45	157	1,484
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present developments that cumulatively would affect active mining claims include existing gravel pits and BLM oil and gas units. The RFFA that cumulatively would affect active mining claims is the TransWest Express Transmission Project.

Permitted Mines

Permitted mines occur intermittently along the COUT BAX alternative routes, and cumulative effects on permitted mines along Alternative COUT BAX-E are less than Alternatives COUT BAX-B and COUT BAX-C (Table 4-17).

TABLE 4-17
MINERAL RESOURCES (PERMITTED MINES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	613	165	0	0	165	448
COUT BAX-C	613	165	0	0	165	448
COUT BAX-E	535	76	0	0	76	460
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present developments that cumulatively would affect permitted mines along the COUT BAX alternative routes would include:

- exiting gravel pits
- BLM oil and gas units
- various mines
- Ferron Natural Gas Project
- Enterprise Mid-America Pipeline

There are no known RFFAs that would cumulatively affect permitted mines in the area of analysis.

Coal and Other Leases

Coal and other leases occur frequently along the COUT BAX alternative routes (Table 4-18). Cumulative effects on these types of leases along the COUT BAX alternative routes would be equal along Alternatives COUT BAX-B and COUT BAX-C and less along Alternative COUT BAX-E.

TABLE 4-18
MINERAL RESOURCES (COAL AND OTHER LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	79,116	42,530	665	250	43,445	35,671
COUT BAX-C	79,116	42,530	665	248	43,443	35,672
COUT BAX-E	135,272	32,982	1,233	304	34,519	100,753

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that cumulatively would affect coal and other leases along the COUT BAX alternative routes would include:

- existing mines and leases
- BLM oil and gas units
- Ferron Natural Gas Project
- Liberty Pioneer Gas Exploration project
- UDOGM oil and gas well pads
- Enterprise Mid-America Pipeline

RFFAs that would cumulatively affect coal and other leases would include:

- Narrows proposed reservoir site
- TransWest Express Transmission Project
- Green River Industrial project

Oil and Gas Leases

Oil and gas leases occur frequently along the COUT BAX alternative routes, and cumulative effects would be greatest along Alternative COUT BAX-C, and would be least along Alternative COUT BAX-E (Table 4-19).

TABLE 4-19
MINERAL RESOURCES (OIL AND GAS LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT BAX-B	536,434	49,710	5,051	1,923	56,684	479,750
COUT BAX-C	546,252	50,913	20,239	1,859	73,010	473,242
COUT BAX-E	542,612	41,514	10,657	1,910	54,080	488,532

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on oil and gas leases include:

- various existing oil and gas well pads on lands administered by BLM and SITLA
- potash leases
- Ferron Natural Gas project
- Enterprise Mid-America Pipeline

RFFAs that would be cumulative effects on oil and gas leases include:

- TransWest Express Transmission Project
- Green River Industrial project
- proposed Narrows reservoir
- Woodside power generation project

Geothermal Leases

Geothermal leases occur infrequently along the COUT BAX alternative routes and cumulative effects on geothermal leases would only occur along Alternative COUT BAX-E (Table 4-20).

TABLE 4-20
MINERAL RESOURCES (GEOTHERMAL LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT BAX-B	26	0	0	0	0	26
COUT BAX-C	26	0	0	0	0	26
COUT BAX-E	78	1	25	0	26	52

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Currently, there are no past or present developments that would have cumulative effects on geothermal leases. RFFAs that cumulatively would affect geothermal leases would include the Woodside power generation project and the TransWest Express Transmission Project.

Potential Mineral Resource Areas

Potential mineral resource areas occur frequently along the COUT BAX alternative routes, and cumulative effects would be greatest along Alternative COUT BAX-C (Table 4-21).

TABLE 4-21
MINERAL RESOURCES (POTENTIAL MINERAL RESOURCE AREAS)
CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

		No Action Alternative				
Alternative Route	Total Available Resource	Past and Present Development	Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT BAX-B	312,535	28,012	6,102	3,094	37,208	275,327
COUT BAX-C	325,548	29,574	18,028	2,825	50,426	275,122
COUT BAX-E	330,876	27,897	17,758	3,015	48,670	282,206

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

4.3.2.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes

Geologic Hazards

The COUT alternative routes cross nearly equal areas of Quaternary faults that would have potential cumulative effects on the Project and other projects. There are no areas with potential mine subsidence crossed by the COUT alternative routes. Cumulative effects from Quaternary faults on projects would occur only where other projects are sited in the immediate vicinity of the Project.

Soil Resources

Sensitive Soils

The greatest cumulative effects on sensitive soils and moderate or high susceptibility to water or wind erosion would occur along Alternative COUT-B and the least cumulative effects would occur along Alternative COUT-H (Table 4-22).

TABLE 4-22
SOIL RESOURCES (SENSITIVE SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

		No Action Alternative				
Alternative Route	Total Available Resource	Past and Present Development	Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-A	24,627	3,389	2,847	2,854	9,090	15,537
COUT-B	25,461	3,473	4,064	2,353	9,890	15,570
COUT-C (Agency and Applicant Preferred Alternative)	22,537	3,075	3,158	2,785	9,018	13,519
COUT-H	22,296	3,489	2,763	1,956	8,208	14,088
COUT-I	27,327	4,328	2,186	2,846	9,359	17,968

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on sensitive soils include:

- historic fire perimeters from 2000 to 2011
- Roosevelt pipeline
- BLM oil and gas units in the Vernal Field Office
- oil and gas leases on Colorado state lands
- oil and gas leases and well pads on Utah state lands

RFFAs that would have cumulative effects on sensitive soils would include:

- Strawberry Highlands project
- TransWest Express Transmission Project

Designated Prime and Unique Farmland Soils

Designated Prime and Unique Farmland soils occur along the COUT alternative routes and would experience the greatest cumulative effects along Alternative COUT-B (Table 4-23). The least cumulative effects would occur along Alternative COUT-C.

TABLE 4-23
SOILS RESOURCES (FARMLAND SOILS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	27,517	12,521	456	208	13,185	14,332
COUT-B	29,429	13,731	485	197	14,413	15,016
COUT-C (Agency and Applicant Preferred Alternative)	17,097	9,279	252	126	9,657	7,440
COUT-H	22,187	10,555	362	115	11,032	11,155
COUT-I	20,900	9,960	336	183	10,480	10,420

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on designated Prime and Unique Farmland soils would include:

- historic fire perimeters between 2000 and 2011
- BLM oil and gas units in the Vernal and Price Field Offices
- oil and gas leases on Colorado state lands
- oil and gas leases and well pads on Utah state lands

RFFAs that would have cumulative effects on designated Prime and Unique Farmland soils would include:

- Narrows proposed East Bench and Oak Creek pipeline
- Mona South transmission line project
- TransWest Express Transmission Project

Existing Mineral Operations

Active Mines and Producing Wells

Active mines and producing wells occur to varying degrees along the COUT alternative routes (Table 4-24). Cumulative effects on active mines and producing wells would be the greatest along Alternatives COUT-H and COUT-I and the least along Alternatives COUT-A and COUT-B.

TABLE 4-24
MINERAL RESOURCES (ACTIVE MINES AND PRODUCING WELLS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-A	22,614	12,635	286	97	13,018	9,596
COUT-B	23,908	12,701	325	82	13,108	10,800
COUT-C (Agency and Applicant Preferred Alternative)	41, 281	19,661	339	231	20,232	21,049
COUT-H	53,992	30,542	369	229	31,140	22,852
COUT-I	63,137	34,668	462	288	35,418	27,719

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that cumulatively would affect active mines and producing wells include:

- existing mines
- oil and gas units in the BLM Vernal Field Office
- oil and gas leases or well pads on Utah state lands
- Roosevelt pipeline

RFFAs that cumulatively would affect active mines and producing wells would include:

- Blacktail Ridge exploratory drilling project
- TransWest Express Transmission Project

Active Mining Claims

Active mining claims occur equally along Alternatives COUT-C, COUT-H, and COUT-I (Table 4-25).

TABLE 4-25
MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-A	0	0	0	0	0	0
COUT-B	0	0	0	0	0	0

TABLE 4-25
MINERAL RESOURCES (ACTIVE MINING CLAIMS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-C (Agency and Applicant Preferred Alternative)	25,712	2,227	89	72	2,389	23,323
COUT-H	25,712	2,227	89	72	2,388	23,324
COUT-I	26,163	2,231	89	76	2,396	23,767

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that cumulatively would affect active mining claims would include:

- special active mineral permits
- metalliferous mineral leases and oil and gas leases on Utah state lands
- BLM oil and gas units in the Vernal Field Office

The RFFA that cumulatively would affect active mining claims is the TransWest Express Transmission Project.

Permitted Mines

Permitted mines occur infrequently along the COUT alternative routes and Alternative COUT-I would have the greatest cumulative effects (Table 4-26).

TABLE 4-26
MINERAL RESOURCES (PERMITTED MINES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-A	395	52	3	0	55	340
COUT-B	551	56	3	0	59	492
COUT-C (Agency and Applicant Preferred Alternative)	499	56	3	0	59	439
COUT-H	156	30	7	0	36	120
COUT-I	268	117	0	0	117	151

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present developments that cumulatively would affect permitted mines along the COUT alternative routes include:

- oil and gas leases on Utah state lands
- BLM oil and gas units in the Price Field Office
- Ferron Natural Gas project

The RFFA that cumulatively would affect permitted mines is the TransWest Express Transmission Project.

Coal and Other Leases

Coal and other leases would occur frequently along the COUT alternative routes and Alternative COUT-I would have the greatest cumulative effects and Alternative COUT-B would have the least cumulative effects (Table 4-27).

TABLE 4-27
MINERAL RESOURCES (COAL AND OTHER LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	3,308	1,547	37	25	1,609	1,699
COUT-B	2,656	538	43	0	581	2,075
COUT-C (Agency and Applicant Preferred Alternative)	7,322	1,240	38	17	1,295	6,027
COUT-H	105,410	25,212	612	17	25,841	79,568
COUT-I	155,510	58,263	845	176	59,284	96,225

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on coal and other leases would include:

- various mines
- BLM oil and gas units in the Vernal Field Office
- oil and gas leases on Colorado state lands
- oil and gas leases, well pads, metalliferous mineral leases, and active mineral material permits on Utah state lands

RFFAs that cumulatively would affect coal and other leases would include:

- TransWest Express Transmission Project
- Kerr-McGee oil and gas development project
- Narrows proposed reservoir

Oil and Gas Leases

Oil and gas leases occur frequently along the COUT alternative routes (Table 4-28). Alternative COUT-I would have the greatest cumulative effects and Alternative COUT-A would have the least.

TABLE 4-28
MINERAL RESOURCES (OIL AND GAS LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-A	224,917	23,014	2,720	1,199	26,932	197,985
COUT-B	279,177	27,404	3,020	1,082	31,506	247,671
COUT-C (Agency and Applicant Preferred Alternative)	471,604	63,901	3,325	1,769	68,995	402,609
COUT-H	511,427	71,097	3,174	1,466	75,737	435,691
COUT-I	627,257	91,583	4,019	2,250	97,852	529,405

NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Past and present developments that would have cumulative effects on oil and gas leases include:

- various mines
- Roosevelt pipeline
- BLM oil and gas units in the Vernal, Price, and Richfield Field Offices
- oil and gas leases on Colorado state lands
- oil and gas leases and well pads on Utah state lands
- metalliferous mineral on Utah state lands

RFFAs that cumulatively would affect oil and gas leases would include:

- TransWest Express Transmission Project
- Kerr-McGee oil and gas development

Geothermal Leases

Geothermal leases occur rarely along the COUT alternative routes (Table 4-29). Alternatives COUT-C, COUT-H, and COUT-I would have the greatest cumulative effect. No cumulative effects on geothermal leases would occur along Alternatives COUT-A and COUT-B.

TABLE 4-29
MINERAL RESOURCE (GEOTHERMAL LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-A	26	0	0	0	0	26
COUT-B	26	0	0	0	0	26
COUT-C (Agency and Applicant Preferred Alternative)	52	14	0	0	14	38

TABLE 4-29
MINERAL RESOURCE (GEOTHERMAL LEASES) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-H	52	14	0	0	14	38
COUT-I	104	14	0	1	15	89
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present development that would have cumulative effects on geothermal leases would include oil and gas leases and well pads and oil shale leases on Utah state lands. The RFFA that would have cumulative effects on geothermal leases is the Kerr-McGee oil and gas development project.

Potential Mineral Resource Areas

Areas identified as having potential mineral resources are common along the COUT alternative routes and Alternative COUT-I would have the greatest cumulative effect (Table 4-30).

TABLE 4-30
MINERAL RESOURCES (POTENTIAL MINERAL RESOURCE AREAS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Routes	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	225,939	35,444	7,423	2,569	45,435	180,505
COUT-B	238,896	32,473	5,834	1,959	40,266	198,630
COUT-C (Agency and Applicant Preferred Alternative)	226,065	28,010	4,663	2,770	35,443	190,622
COUT-H	226,146	188,506	4,756	1,952	39,592	186,554
COUT-I	271,242	42,498	4,993	2,850	50,341	220,901
NOTE: Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.						

4.3.3 Paleontological Resources

The approach for analysis of cumulative effects on paleontological resources, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.3) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.3.1 Potential Impacts on Paleontological Resources

Paleontological resources can be affected directly by disturbance or destruction of buried, in-situ fossils as a result of ground-disturbing activities, including, access road creation, leveling of transmission tower sites, pipeline trenching, or mine excavation. Indirect impacts on paleontological resources include increased potential for vandalism or unauthorized collection of fossils due to increased public access into previously difficult to access areas.

4.3.3.2 Existing Condition

Numerous geologic units are present in the CIAA for the Project containing moderate to very high PFYCs (PFYCs 3, 4 and 5). These geologic units range from small exposed areas to very large areas encompassing several states. These geologic units are known to have contained paleontological resources in the past.

The geologic units and their PFYC classifications crossed by the WYCO alternative routes are shown in Table 4-31.

TABLE 4-31
GEOLOGICAL UNITS CROSSED BY THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
WYCO-B (Agency and Applicant Preferred Alternative)	Wasatch Formation, Luman Tongue (Green River Formation), Tipton Shale (Green River Formation), Laney Member (Green River Formation, Cathedral Bluffs Tongue (Wasatch Formation), Niobrara Formation, Ferris Formation, Hanna Formation, Mesaverde Group, Lance Formation, Bridger Formation, Browns Park Formation, Iles Formation	Steele Shale, Lewis Shale, Fort Union Formation, Medicine Bow Formation, Miocene Rocks, Mancos, Sego Sandstone/Buck Tongue
WYCO-C	Wasatch Formation, Luman Tongue (Green River Formation), Tipton Shale (Green River Formation), Wilkins Peak Member (Green River Formation), Cathedral Bluffs Tongue (Wasatch Formation), Niobrara Formation, Hanna Formation, Ferris Formation, Laney Member (Green River Formation), Washakie Formation, Mesaverde Group, Lance Formation, Bridger Formation, Browns Park, Iles Formation	Steele Shale, Lewis Shale, Fort Union Formation, Medicine Bow Formation, Miocene Rocks, Sego Sandstone/Buck Tongue, Mancos
WYCO-D	Ferris Formation, Tipton Shale (Green River Formation), Hanna Formation, Lance Formation, Mesaverde Group, Niobrara Formation, Wasatch Formation, Cathedral Bluffs Tongue (Wasatch Formation), Browns Park Formation, Iles Formation, Williams Fork Formation	Fort Union Formation, Lewis Shale, Medicine Bow Formation, Miocene Rocks, Steele Shale, Laramie Formation, Madison Limestone, Mancos, Sego Sandstone/Buck Tongue

TABLE 4-31
GEOLOGICAL UNITS CROSSED BY THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
WYCO-F	Ferris Formation, Luman Tongue (Green River), Tipton Shale (Green River), Hanna Formation, Lance Formation, Mesaverde Group, Niobrara Formation, Wasatch Formation, Cathedral Bluffs Tongue (Wasatch Formation), Bridger Formation, Browns Park Formation, Laney Member (Green River Formation), Iles Formation	Fort Union Formation, Lewis Shale, Medicine Formation, Miocene Rocks, Steele Shale, Mancos, Sego Sandstone/Buck Tongue

The geologic units and their PFYC ratings, crossed by the COUT BAX alternative routes are shown in Table 4-32.

TABLE 4-32
GEOLOGICAL UNITS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
COUT BAX-B	Dakota Sandstone and Burro Canyon Formations, Green River, Iles Formation, Mesaverde Group, Wasatch Formation, Williams Fork Formation, Duchesne River Formation, Morrison Formation, North Horn Formation	Hunter Canyon, Mancos, Mt. Garfield Formation and Sego Sandstone, Sego Sandstone/Buck Tongue, Arapien Shale and Summerville Formation, Glen Canyon Group, Indianola Formation
COUT BAX-C	Same as COUT BAX-B	Same as COUT BAX-B
COUT BAX-E	Same as COUT BAX-B	Same as COUT BAX-B

The geologic units and their PFYC ratings, crossed by the COUT alternative routes are shown in Table 4-33.

TABLE 4-33
GEOLOGICAL UNITS CROSSED BY THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative Route	Geological Formations with a Potential Fossil Yield Classification of 4 or 5 (High Sensitivity)	Geological Formations with a Potential Fossil Yield Classification of 3 (Moderate Sensitivity)
COUT-A	Mesaverde Group, Duchesne River Formation, Green River Formation, North Horn Formation, Wasatch Formation	Mancos, Sego Sandstone/Buck Tongue, Arapien Shale, Summerville Formation, Indianola Formation
COUT-B	Same as COUT-A	Same as COUT-A
COUT-C (Agency and Applicant Preferred Alternative)	Same as COUT-A	Same as COUT-A
COUT-H	Same as COUT-A	Same as COUT-A
COUT-I	Same as COUT-A	Same as COUT-A

4.3.3.3 Results

4.3.3.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

The WYCO alternative routes share alignments along Links W15, W30, W32, W35, W36, and C175. The impacts from the Project would contribute cumulatively to the impacts of other past and present projects and RFFAs on those geologic units with moderate or high sensitivity. However, application of design features of the Proposed Action, including preconstruction surveys for paleontological resources, would be anticipated to minimize the incremental effects.

Projects that could have cumulative effects associated with the implementation of the Project, for the WYCO alternative routes, are shown in Table 4-34.

TABLE 4-34
PAST, PRESENT, AND OTHER REASONABLY FORESEEABLE FUTURE ACTIONS FOR PALEONTOLOGICAL RESOURCES IN THE CUMULATIVE IMPACTS ANALYSIS AREA OF THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Past and Present Actions	Reasonably Foreseeable Future Actions
WYCO-B (Agency and Applicant Preferred Alternative)	Chokecherry and Sierra Madre Wind Farm, Gateway West Transmission Project, Anadarko Atlantic Rim Natural Gas Project, PacifiCorp Seven Mile Hill Wind Energy Facility, Bureau of Land Management Oil and Gas Leases, Carl Allen 45, Colorado State Oil and Gas Leases, Wyoming State Oil and Gas Leases, Wyoming State Land Uranium Lease	Continental Divide-Creston Junction Oil and Gas Project, TransWest Express Transmission Project, Hogback Ridge (Whirlwind I) Wind Energy Project
WYCO-C	Same as WYCO-B	Same as WYCO-B
WYCO-D	Same as WYCO-B, excluding Carl Allen 45	Same as WYCO-B, but with the addition of Trapper Mine Exploratory Coal Mine, and SWEPI LP Oil and Gas Development
WYCO-F	Same as WYCO-B	Same as WYCO-B

For the WYCO alternative routes, development associated with several large past and present actions have contributed to cumulative impacts on paleontological resources, including the Chokecherry and Sierra Madre Wind Farm, Gateway West Transmission Project, and oil and gas development on BLM-administered land. In addition to Project impacts, RFFAs, such as the TransWest Express Transmission Project, if implemented would add to the cumulative effects on paleontological resources. For the WYCO alternative routes, the extent of cumulative development would be the same because the same past and other present actions and RFFAs occur in the CIAA with the exception of the Trapper Exploratory Coal Mine and SWEPI LP Oil and Gas Development, which are exclusive to Alternative WYCO-D. Also, Carl Allen 45 oil and gas development would be excluded from cumulative effects associated with Alternative WYCO-D. Overall, the cumulative effects associated with the Project along any of the WYCO alternative routes would be similar. Application of selective mitigation measures, including preconstruction surveys for paleontological resources, is anticipated to minimize the incremental Project effects.

4.3.3.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Projects that could have cumulative effects associated with the implementation of the Project, for the COUT BAX alternative routes, are shown in Table 4-35.

TABLE 4-35
PAST, PRESENT, AND OTHER REASONABLY FORESEEABLE FUTURE ACTIONS FOR PALEONTOLOGICAL RESOURCES IN THE CUMULATIVE EFFECTS STUDY AREA OF THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Alternative	Past and Present Actions	Reasonably Foreseeable Future Actions
COUT BAX-B	Banning Siding Loadout Coal Mine, Bear Canyon Coal Mine, COVOL Site Coal Mine, Deer Creek Coal Lease, Dugout Coal Mine, Hiawatha Complex Coal Mine, Savage Coal Terminal, Star Point Waste Fuel Coal Mine, Sunnyside Refuse/Slurry Coal Mine, Wildcat Loadout Coal Mine, Flatirons Resources #1-4 Compressor Plant and Pipeline, Utah National Guard Engineering Battalion Training Area, abandoned White Sands Missile Launch Facility, Utah State Institutional Trust Lands Administration Active Leases (shale, mineral, and potash), Bureau of Land Management Oil and Gas Leases, Ferron Natural Gas Project, Colorado State Oil and Gas Leases, Utah Division of Oil, Gas and Mining Oil and Gas Well Pads, Enterprise Mid-America Pipeline, Western Expansion II Pipeline, and Residential Areas	TransWest Express Transmission Project, Price Residential and Annexations, Woodside Power Generation
COUT BAX-C	Same as COUT BAX-B	Same as COUT BAX-B with the addition of Blue Castle Footprint for Proposed Nuclear Power Plant and Twin Bridges Resources, LLC Oil and Gas Development, and Green River Industrial
COUT BAX-E	Same as COUT BAX-B	Same as COUT BAX-B with the addition of Blue Castle Footprint for Proposed Nuclear Power Plant and Twin Bridges Resources, LLC Oil and Gas Development, and Green River Industrial

The COUT BAX alternative routes share alignments along Links C177, C185, C195, C196, C197, C270, U490, U486, and U487. The impacts from the Project would contribute cumulatively to the impacts of past and present projects and RFFAs on those geological units with moderate or high sensitivity. However, application of selective mitigation measures, including preconstruction surveys for paleontological resources, is anticipated to minimize the incremental Project effects.

For the COUT BAX alternative routes, development associated with several large past and present actions have contributed to cumulative impacts on paleontological resources, including activities on SITLA Active Leases and Colorado State Oil and Gas Leases that are large in scope. Several mines also are present. In addition to Project impacts, RFFAs, such as TransWest Express Transmission Project, if implemented, would add to the cumulative effects on paleontological resources. For the COUT BAX alternative routes, the extent of cumulative development would be similar because some of the same past and other present actions and RFFAs occur in the CIAA for alternative routes. However, three additional RFFAs in the CIAA for Alternatives COUT BAX-C and COUT BAX-E (the Blue Castle Nuclear Plant, Green River Industrial, and Twin Ridges Resources, LLC Oil and Gas Development) would occur. Thus, the extent of potential cumulative effects associated with cumulative development associated with Alternatives COUT BAX-C and COUT BAX-E would be greater than those for Alternative COUT BAX-B.

4.3.3.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

The COUT alternative routes share alignments along Links C186, U460, U621, U638, U639, and U640. The impacts from the Project would contribute cumulatively to the impacts of other present, past projects, and RFFAs on those geological units with moderate or high sensitivity. However, application of selective mitigation measures, including preconstruction surveys for paleontological resources, is anticipated to minimize the incremental Project effects.

Similar past and present actions are in the CIAA for Alternatives COUT-A, COUT-B, COUT-C, as are the past and present actions in the CIAA for Alternatives COUT-H and COUT-I. The RFFAs in the CIAA for all COUT alternatives routes are similar. Projects that could have cumulative effects associated with the implementation of the Project for the COUT alternative routes are shown in Table 4-36.

TABLE 4-36
PAST, PRESENT, AND OTHER REASONABLY FORESEEABLE FUTURE ACTIONS FOR PALEONTOLOGICAL RESOURCES IN THE CUMULATIVE EFFECTS STUDY AREA OF THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Alternative	Past and Present Actions	Reasonably Foreseeable Future Actions
COUT-A	BLM Oil and Gas Leases, Colorado State Oil and Gas Leases, Utah State Institutional Trust Lands Administration (SITLA) Oil and Gas Leases	TransWest Express Transmission Project
COUT-B	Same as COUT-A	Same as COUT-A
COUT-C (Agency and Applicant Preferred Alternative)	Same as COUT-A	Same as COUT-A
COUT-H	Banning Siding Loadout Coal Mine, Bear Canyon Coal Mine, COVOL Site Coal Mine, Dugout Coal Mine, Hiawatha Complex Coal Mine, Savage Coal Terminal, Star Point Waste Fuel Coal Mine, Sunnyside Refuse/Slurry Coal Mine, Wildcat Loadout Coal Mine, Utah National Guard Engineering Battalion Training Area, SITLA Active Oil and Gas Leases, SITLA Active Sand and Gravel Permits, BLM Oil and Gas Leases, Ferron Natural Gas Project, Colorado State Oil and Gas Leases, Utah Division of Oil, Gas and Mining Oil and Gas Well Pads, Enterprise Mid-America Pipeline, and Residential Areas	TransWest Express Transmission Project, Price Residential and Annexations
COUT-I	Same as COUT-H	Same as COUT-H

For Alternatives COUT-A, COUT-B, and COUT-C, development associated with several large past and present actions have contributed to cumulative impacts on paleontological resources, including activities on BLM and Colorado State Oil and Gas Leases. In addition to Project impacts, RFFAs such as TransWest Express Transmission Project, if implemented, would add to the cumulative effects on paleontological resources.

Alternatives COUT-H and COUT-I have the same cumulative effects as Alternatives COUT-A, COUT-B, and COUT-C with the addition of several coal mines, SITLA leases, well pads, and other facilities. The TransWest Express transmission line is also an RFFA for Alternatives COUT-H and COUT-I, as well as the Price Residential Area and Annexations. Therefore, implementation of these projects could contribute to the cumulative effects on paleontological resources if appropriate mitigation was not applied.

4.3.4 Water Resources

The geographic and temporal scopes defined for analysis of cumulative effects on water resources is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (Section 3.2.4) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

As discussed in Section 3.2.4.4.2, impacts on groundwater resources from this Project have been found to be negligible and are not assessed further.

For this analysis, water resources were categorized separately as either surface water resources (perennial waters such as streams and lakes) or wetland-riparian water resources (waters associated with wetland and riparian systems) to most appropriately assess potential cumulative impacts on water resources relative to issues identified for analysis (Table 4-3). Water resources in each subbasin consist of line and polygon features from the NHD. Line features such as perennial streams were buffered by 100 feet to create a conservative polygon 200 feet wide. No buffer was applied to polygon features, including perennial lakes, reservoirs, ponds, etc. The area included in the original feature attributes was used in the analysis. These areas were then combined, respectively, for either surface water resources or wetland-riparian water resources to calculate the total water resources, in acres, for each subbasin; which when combined with all other subbasins crossed by a Project alternative route, represents the CIAA for that proposed alternative route. Cumulative impacts by alternative route are addressed quantitatively where possible. Additional cumulative effects on water resources, particularly valuable or susceptible to ground-disturbing activities (e.g., specially designated waters, wetlands and riparian areas, perennial systems) or areas with high potential for discharging erosion-related sediment into water resources (i.e., areas particularly susceptible to erosion), are addressed qualitatively in Section 4.3.4.3.

4.3.4.1 Issues Identified for Analysis

4.3.4.1.1 Potential Impacts on Surface Water Quality

Surface-water quality is an important feature of watershed health that, when maintained, provides long-term, beneficial effects on the environment.

4.3.4.1.2 Potential Impacts on Wetlands, Riparian Areas, and Associated Water Quality

Modification of wetlands and riparian areas can result in direct and indirect impacts on the functional capacity of these vegetation communities to maintain water quality.

4.3.4.1.3 Potential Impacts on Areas Particularly Susceptible to Erosion

Ground-disturbing activities in areas of fragile or highly erodible soils can contribute to adverse effects on water resources over the short- and long-term. Some impacts can be mitigated by application of design features of the Proposed Action or selective mitigation measures.

4.3.4.2 Existing Condition

Agriculture and residential, commercial, and industrial development have influenced existing water resources throughout the Project area by modification of existing water resources such as development of water wells, piping existing streams and rivers for redirection and distribution, production and disposal of effluent, and capture/storage and discharge of surface water from manmade reservoirs or other storage facilities such as water towers. As with this Project, commercial and industrial projects are required to follow federal and state regulations requiring design features and selective mitigation measures to maintain compliance with regulations (referenced in Chapter 3) to minimize or reduce impacts on water resources. Incremental effects on water resources can include, but are not limited to, decreases in water quality as a result of sedimentation from construction of stream crossings;, vegetation clearing, including upland, riparian and wetland areas; modification of existing stream channels; and introduction of contaminants into or surface water through accidental spills.

In Wyoming, industrial development primarily associated with oil and gas production constitutes the greatest impact on water resources; in particular, the area between the I-80 corridor and the Wyoming-Colorado border. These developments require ground disturbance that can alter natural hydrology as well as destabilize soil leading to increased erosion and sediment transport to receiving waters.

In Colorado, existing development is located primarily along Colorado State Highway 13 and U.S. Highway 40 and is associated with dispersed rural residences and agricultural development. South of Rangely toward Baxter Pass, areas of oil and gas development are located along Moffat County Road 23 and along the floor of West Salt Creek Canyon south of Baxter Pass. Several existing transmission lines run from the Craig Power Station adjacent to U.S. Highway 40 to the Colorado-Utah border south of the community of Dinosaur. Similar to Wyoming, these developments require ground disturbance that can alter natural hydrology as well as destabilize soil, leading to increased erosion and sediment transport to receiving waters.

In Utah, existing oil and gas development in several areas—including the Uinta Basin, Castle Valley, and northwest of Cisco and dispersed residences and agricultural developments in the Uinta Basin, Castle Valley, Sanpete Valley, and Juab Valley—have modified existing water resources through ground disturbance and increased sedimentation from development of roads, facilities such as well pads, residences, and rights-of-way.

Not all modification of hydrology results in adverse effects on water resources. Development of springs, reclamation of damaged streams, construction, rehabilitation, and conservation of wetlands and riparian areas, and effluent treatment facilities can lead to beneficial effects on water resources by maintaining water quality.

In addition to the previously listed developments, wildfires and vegetation management practices that modify riparian and wetland habitats can affect water resources by decreasing soil stability, inhibiting the ability to moderate heavy flows, and removing shade. Modification of this nature results in higher water temperatures, decreased oxygen potential, and embeddedness of the substrate, which reduces breeding habitat that many aquatic species rely on for reproduction. The subsequent outcome of these results can change water temperature and chemistry and potential introduction of invasive species due to changes in riparian and wetland functionality, flow dynamics, water quality, and habitat availability. Water resources affected by wildfires and vegetation management were excluded from the quantitative analysis as aquatic communities can recover from these events. Recovery from wildfires depends on the time since the occurrence, precipitation amounts, vegetation community type, fire intensity, and degree of associated degradation (weed invasion, soil loss, soil hydrophobicity, and alteration of riparian community structure).

4.3.4.3 Results

4.3.4.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Results of the analysis of cumulative effects on surface and wetland-riparian water resources are summarized in Tables 4-37 and 4-38.

TABLE 4-37
SURFACE WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	184,552	13,400	546	11	13,957	170,596
WYCO-C	184,552	13,400	546	13	13,959	170,594
WYCO-D	236,067	20,153	639	26	20,817	215,249
WYCO-F	184,552	13,400	546	11	13,956	170,596

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-38
WETLAND-RIPARIAN WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	194,291	43,388	1,809	39	45,236	149,056
WYCO-C	194,291	43,388	1,809	41	45,238	149,053
WYCO-D	209,399	46,976	1,824	46	48,845	160,554
WYCO-F	194,291	43,388	1,809	35	45,232	149,059

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Water resources in the CIAA for the WYCO alternative routes are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 184,552 and 236,067 acres of surface water resources and between 194,291 and 209,399 acres of wetland-riparian water resources, depending on the alternative route. Major perennial and intermittent systems in the area, detailed in Section 3.2.4.3.2 include, but are not limited to, the Medicine Bow, Upper North Platte, Little Snake, and White rivers, as well as Muddy Creek.

Ground-disturbing activities associated with past and present activities in the CIAA for the WYCO alternative routes, which could currently be affecting water resources. These activities include coal mines the Gateway West Transmission Project, noncoal mines, including the Sweetwater and Terry Hankins mines; oil and gas development; oil shale and tar sands development; pipelines, including the Enterprise Mid-America and Western Expansion II pipelines; residential developments; and wind-energy facilities.

Past and present development has contributed to some level of ground disturbance which, over time, is expected to be compliant with federal and state reclamation requirements. Where past and present development are not meeting reclamation requirements, water resources could be affected by increased sediment loading in the intermittent and perennial systems located in proximity to the CIAA for the WYCO alternative routes, especially in the watersheds feeding Muddy Creek and the Little Snake River in the Rawlins and Little Snake Field Offices where sensitive soils are highly prone to erosion and subsequent sedimentation. Refer to Section 3.2.2 for a description and location of fragile soils in the area of the WYCO alternative routes.

In addition to the effects of past and present actions, water resources in the CIAA in association with the WYCO alternative routes have been affected by wildfires and vegetation management actions. The water resources affected by wildfires in the CIAA for the WYCO alternative routes occur mostly in Moffat County, Colorado, with the greatest concentration of wildfires associated with the CIAA for Alternative WYCO-D. Water resources affected by vegetation management actions, including prescribed burns, occur mostly in Carbon County, Wyoming, in association with Alternative WYCO-D. The Mud Springs (2007), Bitter Brush (2006), Lone Tree (2007), and Winter Valley (2000) fires, as well as prescribed burns and other vegetation management treatments conducted by the BLM Rawlins and Little Snake Field Offices, account for most of the effect on water resources resulting from wildfires or vegetation management actions. As recovery from disturbance events depends on the time since the occurrence, precipitation amounts, vegetation community type, disturbance intensity, and degree of associated degradation, it is difficult to determine the degree of localized recovery relative to each of the listed events. However, due to the amount of time that has elapsed since many of the listed events, water resources in the CIAA as a whole are likely in various stages of recovery.

The RFFAs in the CIAA include the proposed Project, the Rosebud coal mine, the Continental Divide-Creston Junction and Kerr-McGee oil and gas projects, and TransWest Express transmission projects, and the Hogback Ridge (Whirlwind I) Wind Energy Project.

Ground disturbance from implementation of RFFAs, including the Project, has the potential for localized short-term adverse cumulative effects on water resources in the CIAA. Short-term impacts could include degradation of the quality of waters from sedimentation as a result of destabilization of fragile soils and modification of upland, riparian, and wetland vegetation. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative effects on water resources.

The incremental effect of Project development on surface water resources estimated for the WYCO alternative routes differ between alternative routes. The incremental Project development would account for approximately 11 to 26 acres (approximately 0.07 to 0.1 percent) of the total estimated cumulative effect on surface water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on approximately 13,956 to 20,817 acres (approximately 8 to 9 percent) of the total available surface water resources in the CIAA. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

The incremental effect of Project development on wetland-riparian water resources estimated for the WYCO alternative routes differs between alternative routes. The incremental Project development would account for approximately 35 to 46 acres (approximately 0.07 to 0.09 percent) of the total estimated cumulative effect on wetland-riparian water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on approximately 45,232 to 48,845 acres (approximately 23 percent) of the total available wetland-riparian water resources in the CIAA. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

4.3.4.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Results of the analysis of cumulative effects on surface and wetland-riparian water resources are summarized in Tables 4-39 and 4-40.

TABLE 4-39
SURFACE WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	206,691	16,344	56	47	16,447	190,245
COUT BAX-C	223,389	18,759	241	47	19,047	204,342
COUT BAX-E	223,389	18,759	241	57	19,057	204,333

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-40
WETLAND-RIPARIAN WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	84,804	20,893	77	15	20,985	63,820
COUT BAX-C	99,087	25,065	686	15	25,766	73,322
COUT BAX-E	99,087	25,065	686	17	25,768	73,319

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Water resources in the CIAA for the COUT BAX alternative routes are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 206,691 and 223,389 acres of surface water resources and between 84,804 and 99,087 acres of wetland-riparian water resources, depending on the route. Major perennial systems in the area detailed in Section 3.2.4.3.2 include, but are not limited, to the Green, White, and San Pitch rivers as well as Currant, Huntington, Douglas, Salt, and West creeks.

Ground-disturbing activities associated with past and present activities in the CIAA for the COUT BAX alternative routes, which could currently be affecting water resources, include coal mines, noncoal mines, oil and gas developments, oil shale and tar sands development, pipelines (including the Enterprise Mid-America and Western Expansion II projects), and the Clear Creek residential development.

Past and present development has contributed to some level of ground disturbance which, over time, is expected to be compliant with federal and state reclamation requirements. Where past and present development are not meeting reclamation requirements, water resources could be affected by increased sediment loading in the intermittent and perennial systems close to the CIAA of the COUT BAX alternative routes.

Beneficial effects of other past and present projects also could be affecting water resources. Such effects would be attributed to habitat improvement projects where management of upland, riparian, wetland, and aquatic habitats could indirectly improve water quality.

Cumulative effects related to past and present actions in the CIAA of the COUT BAX alternative routes also could be affecting wetlands and riparian areas. Adverse impacts from developments, which compromise the functional capacity of wetlands and riparian areas, has or is currently affecting water quality in those areas.

In addition to the effects of past and present actions, water resources in the CIAA in association with the COUT BAX alternative routes have been affected by wildfires and vegetation management actions. The water resources affected by wildfires and vegetation management occur mostly along the Wasatch Plateau and occur in comparatively equal concentrations relative to each COUT BAX alternative route. The Seeley (2012), Wood Hollow (2012), and Salt Creek (2007) fires as well as USFS timber sales and fuel treatments conducted by Manti-La Sal National Forest account for most of the effect on water resources resulting from wildfire and vegetation management actions associated with the COUT BAX alternative routes. As recovery from disturbance events depends on the time since the occurrence, precipitation amounts, vegetation community type, disturbance intensity, and degree of associated degradation, it is difficult to determine the degree of localized recovery relative to each of the listed events. However, due to the amount of time that has elapsed since many of the listed events, water resources within the CIAA as a whole are likely in various stages of recovery.

RFFAs in the CIAA for the COUT BAX alternative routes include the proposed Project, the Flat Canyon Coal tracts, the Narrows East Bench Diversion Dam and associated pipelines, proposed oil and gas developments, the TransWest Express Transmission Project, the Narrows Tunnel Project, and the Shalom Electric Boulger timber salvage project.

Ground disturbance from implementation of RFFAs, including the Project, would have the potential for localized short-term, adverse cumulative effects on water resources in the CIAA. Short-term impacts could include degrading the quality of waters from sedimentation as a result of destabilization of sensitive soils and modification of upland, riparian, and wetland vegetation. However, implementation of design features for environmental protection and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative effects on water resources.

Impaired and outstanding waters in Colorado and Utah in the CIAA of the COUT BAX alternative routes (refer to Section 3.2.4.3.2) are especially susceptible to effects from past and present actions and RFFAs. Protective measures mandated through the NPDES largely would mitigate any adverse impacts on impaired waters from those projects but given these waters have already been identified as impaired waters, limitations on allowable TMDLs of source pollutants contributing some level of impairment for 303(d) listed waterbodies are likely already incorporated into the TMDL. These limitations restrict any new sources of impairment; thus, levels of impairment should be either constant or declining as a result of the NPDES program.

In Colorado, the risk of erosion and sedimentation is not as severe as what is expected in Utah. This can be attributed to topography and soil characteristics. Where the CIAA crosses Colorado, slopes are not especially steep and soils are not characterized as highly erodible or otherwise fragile. However, where the CIAA crosses waterbodies and especially perennial systems, the inherent potential for sediment to be discharged into the adjacent waterbody is still relatively high. Where the Project, along with other past and present actions and RFFAs cross water bodies near the Garfield and Rio Blanco county line; there is a greater risk of erosion and sedimentation to adjacent waters.

In Utah, steep topography and the Green River shale formation has resulted in areas of highly erodible soils, particularly susceptible to adverse impacts from ground disturbance, which could result in transport of sediment to downstream waterbodies. Specifically, where the CIAA crosses the Ashley National Forest near Strawberry Reservoir, the southeast portion of the Uinta National Forest, the canyons throughout the Manti-La Sal National Forest, and the mountainous region west-southwest of Huntington, Utah, are areas of greatest concern for erosion.

As a general rule, any areas with steep slopes in proximity to water resources raise the potential that ground disturbance resulting from the Project, as well as past and present actions and RFFAs, would result in sediment being discharged to waterbodies, subsequently decreasing water quality in those systems. For a detailed discussion of areas particularly susceptible to erosion, refer to Section 3.2.2.

The incremental effect of Project development on surface water resources estimated for the COUT BAX alternative routes differs between alternative routes. The incremental Project development would account for approximately 47 to 57 acres (approximately 0.2 to 0.3 percent) of the total estimated cumulative effects on surface water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on approximately 16,447 to 19,057 acres (approximately 8 to 9 percent) of the total surface water resources in the CIAA. However, implementation of design features for environmental protection and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

The incremental effect of Project development on wetland-riparian water resources estimated for the COUT BAX alternative routes differs between alternative routes. The incremental Project development would account for approximately 15 to 17 acres (approximately 0.07 percent) of the total estimated cumulative effect on wetland-riparian water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on approximately 20,985 to 25,768 acres (approximately 25 to 26 percent) of the total available wetland-riparian water resources in the CIAA. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

4.3.4.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Results of the analysis of cumulative effects on surface and wetland-riparian water resources are summarized in Tables 4-41 and 4-42

TABLE 4-41
SURFACE WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	203,932	12,688	221	29	12,938	190,994
COUT-B	207,869	14,609	501	36	15,145	192,724

TABLE 4-41
SURFACE WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-C (Agency and Applicant Preferred Alternative)	207,131	14,899	502	34	15,435	191,696
COUT-H	222,720	17,213	497	17	17,727	204,993
COUT-I	222,720	17,213	497	29	17,739	204,981

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-42
WETLAND-RIPARIAN WATER RESOURCES CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	182,243	51,348	787	66	52,201	130,042
COUT-B	195,635	56,339	861	39	57,239	138,396
COUT-C (Agency and Applicant Preferred Alternative)	185,300	52,799	857	17	53,673	131,627
COUT-H	167,437	52,330	834	7	53,170	114,267
COUT-I	167,437	52,330	834	10	53,174	114,263

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Water resources in the CIAA for the COUT alternative routes are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 203,932 and 222,720 acres of surface water resources and between 167,437 and 195,635 acres of wetland-riparian water resources, depending on the route. Many perennial systems occur in the CIAA and include but are not limited to the Duchesne, Green, Lake Fork, Price, Strawberry, Uinta, and White rivers as well as Argyle, Hop, Indian, Red, Salt, Soldier, Sowers, Thistle, Tie Fork, and Willow creeks.

Ground-disturbing activities associated with past and present activities in the CIAA for the COUT alternative routes, which currently could be affecting water resources. These activities include active coal mines; Central Utah Telephone Fiber Optic communication lines; Lower Duchesne River Wetlands Project; noncoal mine leases on SITLA lands; oil and gas development on BLM-administered land as well as SITLA and private holdings; oil shale and tar sands projects; pipelines, including the Roosevelt, Enterprise Mid-America, Western Expansion-II and the Magnum Gas Storage project; Carbon County proposed ATV trail; and a number of residential developments.

Past and present development has contributed to some level of ground disturbance which, over time, is expected to be compliant with federal and state reclamation requirements. Where past and present development are not meeting reclamation requirements, water resources could be affected by increased sediment loading in the intermittent and perennial systems close to the CIAA of the COUT alternative routes.

In addition to the effects of past and present actions, water resources in the CIAA in association with the COUT alternative routes have been affected by wildfires and vegetation management actions. The water resources potentially affected by wildfires occur mostly along the Wasatch Plateau and occur in comparatively equal concentrations relative to each COUT alternative route. The Seeley (2012), Wood Hollow (2012), Salt Creek (2007), Church Camp (2012) and Mellen (2009) fires account for the most notable wildfire events associated with the COUT alternative routes. Water resources potentially affected by vegetation management actions also occur mostly along the Wasatch Plateau and in association with lands administered by the BLM Vernal Field Office. Vegetation management actions occur in comparatively equal concentrations relative to each COUT alternative route. USFS timber sales and fuel treatments conducted by Manti-La Sal National Forest, as well as habitat projects conducted by the BLM Vernal Field Office, account for most of the effect on water resources associated with vegetation management actions. As recovery from disturbance events depends on the time since the occurrence, precipitation amounts, vegetation community type, disturbance intensity, and degree of associated degradation, it is difficult to determine the degree of localized recovery relative to each of the listed events. However, due to the amount of time that has elapsed since many of the listed events, water resources in the CIAA as a whole are likely in various stages of recovery.

RFFAs in the CIAA for the COUT alternative routes include the proposed Project, the Flat Canyon and Long Canyon coal mine leases, the Narrows Reservoir, East Bench diversion dam, Narrows tunnel and associated Upper Cottonwood and Oak Creek pipelines, the Price industrial complex, oil and gas development from the Kerr-McGee and Monument Butte projects, the Woodside power generation facility, the Narrows highway relocation project, the Shalom Electric Boulger timber salvage project, the Victory Pipeline project, and the TransWest Express Transmission Project.

Ground disturbance from implementation of RFFAs, including the Project, has the potential for localized short-term adverse cumulative effects on water resources in the CIAA. Short-term impacts could be attributed to degrading the quality of waters from sedimentation as a result of destabilization of sensitive soils and modification of upland, riparian, and wetland vegetation. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative effects on water resources.

Impaired and outstanding waters in Colorado and Utah in the CIAA of the COUT alternative routes (refer to Section 3.2.4.3.2) are especially susceptible to past and present actions and RFFAs. Protective measures mandated through the NPDES would largely mitigate any adverse impacts on impaired waters from those projects but given these waters have already been identified as impaired waters, limitations on allowable TMDLs of source pollutants contributing some level of impairment for 303(d) listed waters are already incorporated into the TMDL. These limitations restrict any new sources of impairment; levels of impairment should be either constant or declining as a result of the NPDES program.

In Colorado, the risk of erosion and sedimentation is not as severe as what is expected in Utah. This can be attributed to topography and soil characteristics. Where the CIAA crosses Colorado, slopes are not especially steep and soils are not characterizes as highly erodible or otherwise fragile. However, where the CIAA crosses waterbodies and especially perennial systems, the inherent potential for sediment to be discharged into the adjacent waterbody is still relatively high. Where the Project, along with other past and present actions and RFFAs, crosses water bodies near the Garfield and Rio Blanco county line, there is a greater risk of erosion and sedimentation to adjacent waters.

In Utah, steep topography and the Green River shale formation has resulted in areas of highly erodible soils, particularly susceptible to adverse impacts from ground disturbance, which could result in transport of sediment to downstream waterbodies. Specifically, where the CIAA crosses the Ashley National Forest near Strawberry Reservoir, the southeast portion of the Uinta National Forest, the canyons throughout the Manti-La Sal National Forest, and the mountainous region west-southwest of Huntington, Utah, are areas of greatest concern for erosion.

As a general rule, any areas with steep slopes in proximity to water resources raises the potential that ground disturbance resulting from the Project as well as past and present actions and RFFAs would result in sediment being discharged to waterbodies and subsequently decreasing water quality.

The incremental effect of Project development on surface water resources estimated for the COUT alternative routes differs between alternative routes. The incremental Project development would account for approximately 17 to 36 acres (approximately 0.09 to 0.2 percent) of the total estimated cumulative effects on surface water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on approximately 12,938 to 17,739 acres (approximately 6 to 8 percent) of the total surface water resources in the CIAA. However, implementation of design features for environmental protection and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

The incremental effect of Project development on wetland-riparian water resources estimated for the COUT alternative routes differs between alternative routes. The incremental Project development would account for approximately 7 to 66 acres (approximately 0.01 to 0.1 percent) of the total estimated cumulative effect on wetland-riparian water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on approximately 52,201 to 57,239 acres (approximately 29 percent) of the total available wetland-riparian water resources in the CIAA. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on water resources.

4.3.5 Vegetation

This section addresses cumulative effects on vegetation resources resulting from the Project in addition to other past and present actions and RFFAs. Resources addressed in this section are the same as those described in Section 3.2.5.

The approach for analysis of cumulative effects on vegetation, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative effects analysis for vegetation considers past and present actions and RFFAs (Tables 4-1 and 4-2) in conjunction with direct and indirect impacts from the Project (described in Section 3.2.5.4.3).

Most direct cumulative impacts on vegetation associated with construction of the Proposed Action would occur in the immediate vicinity of access road, transmission line tower, and Project facility construction. However, some anticipated direct and indirect cumulative effects (described in Section 3.2.5.4), such as introduction and spread of noxious weeds, may occur in the immediate vicinity of Project-related construction as well as in a larger geographical context. The geographic scope of the CIAA for vegetation is all subwatersheds (12-digit HUCs) crossed by alternative routes considered. The analysis area is sufficient to analyze all potential cumulative effects of the Project on vegetation.

The temporal scope of the analysis includes 5 years for impacts associated with Project construction and site stabilization. The Proposed Action does not include plans to decommission the Project; therefore, the temporal scope of analysis for impacts associated with operation and maintenance of the Project is based on the assumption that the effects of operating and maintaining the transmission line would persist for the life of the Project (50 years or longer). Because the Proposed Action does not include decommissioning (refer to Section 2.4.9), long-term impacts associated with the presence of the transmission line (e.g., tower foundations) may be permanent.

4.3.5.1 Issues Identified for Analysis

4.3.5.1.1 Potential for Spread of Noxious Weeds

The potential spread of noxious weeds was identified by the agencies and public during scoping as an issue relating to vegetation resources (Table 4-3). The susceptibility of an area to colonization by invasive species increases with vegetation removal and soil disturbance (Hobbs and Huenneke 1992), both of which would occur with Project implementation. Cumulative impacts on vegetation resulting from increased potential for spread of noxious weeds are discussed qualitatively in the results section (Section 4.3.5.3).

4.3.5.1.2 Loss of Native Vegetation Communities

Loss of native upland vegetation communities (this excludes agriculture, developed/disturbed, and invasive vegetation), wetlands, and riparian areas was identified by the agencies and public during scoping as issues relating to vegetation resources (Table 4-3). Removal of vegetation would occur with construction of access roads, transmission towers, and other permanent Project structures. Cumulative impacts on these vegetation types are analyzed quantitatively and discussed quantitatively in the results section (Section 4.3.5.3).

4.3.5.2 Existing Condition

Conversion of native vegetation to agricultural use since settlement of European peoples in the area in the middle of the nineteenth century has significantly affected the character of landscapes and the quantity and quality of vegetation resources in the CIAA. Construction of settlements, transportation systems, and human population growth also has resulted in further conversion of vegetation resources of the area. Drought, wildfire, and climate change have likewise resulted in changes in vegetation resources in more recent times. Incremental modification of the landscape by more recent projects and actions, as described in the previous section, also has occurred in this area, further contributing to its departure from presettlement ecological conditions.

Descriptions of vegetation communities that are crossed by alternatives routes considered for the Project are provided in Section 3.2.5.5. Descriptions of vegetation communities and information on how they relate to GAP land cover types are provided in Appendix J.

4.3.5.3 Results

4.3.5.3.1 Potential for Spread of Noxious Weeds

The removal of vegetation, disturbance of soils, and transportation of seeds by humans and/or livestock increase the likelihood of noxious weed invasion and spread in an area (refer to Section 3.2.5.4.3). Past actions that required the removal of vegetation and disturbance of soil likely resulted in the introduction of some noxious weeds in the CIAA. Present actions that require the removal of vegetation and disturbance of soils also may contribute to the introduction and spread of noxious weeds; however, actions on public lands are required to implement practices to prevent, treat, and monitor noxious weed invasions and, therefore, their impacts are likely to be minimal. Continuing maintenance of these projects is assumed to involve some degree of noxious weed surveying, treatment, and monitoring, which would further reduce the potential for noxious weed invasion due to these actions.

Implementation of the Project would require the removal of vegetation and the disturbance of soils, which would increase the susceptibility of the Project area to noxious weed invasion. A noxious weed management plan would be prepared for the Project based on the principles and procedures outlined in the BLM Integrated Weed Management Manual 9015 and Forest Service Noxious Weed Management Manual 2080 (refer to Table 2-8, Design Feature 5). Implementation of this plan would minimize the spread and introduction of noxious weeds, though some degree of weed invasion and spread is still likely due to large areas of ground disturbance, increased vehicle use, and increased public access that would accompany Project implementation.

Many RFFAs in the CIAA are likely to require the removal of vegetation and the disturbance of soils, further increasing the susceptibility of the Project area to noxious weed invasion. However, RFFAs also are assumed to be required to implement practices to prevent, treat, and monitor noxious weed invasions, thereby minimizing the invasion of noxious weeds due to these projects or activities. For these reasons, the Project and other RFFAs would not be expected to substantially alter the existing effects of noxious weeds on vegetation resources that have occurred as a result of past actions in the CIAA.

4.3.5.3.2 Loss of Native Vegetation Community Types

Permanent loss of vegetation occurs with the construction of features such as roads, well pads, and buildings. Temporary removal or crushing of vegetation does not result in a total loss of vegetation; however, revegetation of these areas, if undertaken, often results in vegetation communities that differ from those that occurred predisturbance. Vegetation communities adjacent to disturbed areas also may differ in structure and composition from those that occurred predisturbance, as soil disturbance and the transportation of seeds of non-native or invasive species by humans and/or livestock may have increased the likelihood of these areas being invaded by non-native species (refer to Section 3.2.5.4.3, for more detail).

Past actions in the CIAA likely involved the removal of vegetation and the alteration of vegetation community composition and structure. Improper grazing practices and other soil-disturbing activities, as well as transport of weed seeds via human and livestock movement, have resulted in large-scale invasion of this area by noxious and invasive weeds.

Present actions also are likely to result in changes to vegetation communities by these same mechanisms, though it is assumed selective mitigation measures or other conditions of approval would be required for actions on public lands to minimize losses of native or desirable vegetation.

Construction of Project features such as access roads, transmission towers, and operations facilities would require the permanent removal of vegetation. Safe operation of the transmission line would require the clearing of tall vegetation in the wire and border zones, which would alter the structure and composition of certain vegetation communities. Non-native plant species are likely to colonize new areas through the transport of seeds by construction and maintenance equipment. Revegetation of disturbed areas is a project design feature of the Proposed Action for environmental protection (refer to Table 2-8, Design Feature 2); however, it would be unlikely that disturbed areas would be restored to predisturbance conditions.

RFFAs that require the construction of permanent project features or introduce non-native plant species also would be likely to result in changes to vegetation community structure. RFFAs would further change composition and structure of some vegetation communities, contributing incrementally to changes in vegetation community composition that have occurred and are projected to occur in the CIAA.

Quantitative analysis of cumulative effects of the loss of vegetation resources was completed through an inventory of each native vegetation community and an estimation of impacts in these communities by past and present actions and the Proposed Action and other RFFAs. Existing quantities of vegetation cover by community (in acres) in the CIAA was determined using reclassified GAP data. Wetland and riparian vegetation communities incorporate NWI data in addition to GAP data. Development associated with past and present actions and RFFAs was estimated using shapefiles of specific projects received from agencies and local governments. Vegetation communities affected by wildfires and vegetation management were excluded from the quantitative analysis, as vegetation communities can recover from these events. Recovery from wildfires depends on the amount of time since the occurrence, precipitation amounts, vegetation community type, and degree of associated degradation (weed invasion, soil loss, and alteration of community structure). Incremental project development was estimated using assumptions of the extent of access road and transmission line tower disturbance per mile of alternative route as described in Section 2.5.1.2.

Predicted cumulative effects on each vegetation community are described in this section. Detailed lists of activities in the CIAAs of each alternative route have been included in the Project administrative record for this Project.

Alpine

The incremental loss of alpine vegetation communities predicted for Alternative WYCO-D and the COUT-BAX and COUT alternative routes would contribute to the cumulative loss of alpine vegetation communities in the CIAA. The extent of cumulative development on alpine vegetation communities for all relevant alternative routes is summarized in Table 4-43.

TABLE 4-43
ALPINE VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	2	0	0	0	0	2
WYCO-C	2	0	0	0	0	2
WYCO-D	20	2	0	0	2	18
WYCO-F	2	0	0	0	0	2
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	4,775	689	6	6	701	4,073
COUT BAX-C	4,775	689	6	6	701	4,073
COUT BAX-E	1,637	292	6	1	300	1,337
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	3,948	1,117	35	5	1,156	2,792
COUT-B	4,960	1,750	48	3	1,801	3,159
COUT-C (Agency and Applicant Preferred Alternative)	2,425	228	19	2	249	2,177
COUT-H	3,495	703	16	2	721	2,773
COUT-I	5,847	1,036	16	17	1,069	4,778

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect alpine vegetation communities include:

- coal mining operations
- pipelines
- oil and gas development
- residential development
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)

RFFAs in the CIAA for alpine vegetation communities include:

- coal mining operations
- residential development
- TransWest Express Transmission Project

Alpine vegetation communities affected by wildfires and vegetation management occur mostly along the Wasatch Plateau. In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, the Seeley (2012) and Salt Creek (2007) fires and USFS timber sales and fuel treatments have affected alpine vegetation communities in the CIAA along the COUT BAX alternative routes and Alternatives COUT-H and COUT- I. Due to the high cover of barren ground and general low production, alpine vegetation communities are naturally fire resistant and mostly unaffected by timber management activities.

The extent of Project-related development in alpine vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-43). Total cumulative effects, including those from the Project, affect a considerable amount of the total extent of these vegetation communities in the CIAA, though these impacts are mainly due to past and present activities (Table 4-43).

Aspen

The loss of aspen vegetation communities for the COUT BAX and COUT alternative routes would contribute to the cumulative loss of alpine vegetation communities in the CIAA. The extent of cumulative development on alpine vegetation communities for all relevant alternative routes is summarized in Table 4-44.

TABLE 4-44
ASPEN VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	444	10	2	0	12	433
WYCO-C	444	10	2	0	12	433
WYCO-D	20,711	1,344	1,260	0	2,604	18,107
WYCO-F	444	10	2	0	12	433
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	52,040	6,729	246	92	7,067	44,973
COUT BAX-C	52,040	6,729	246	91	7,067	44,973
COUT BAX-E	72,927	11,796	252	61	12,109	60,817

TABLE 4-44
ASPEN VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	56,094	926	1,918	112	2,957	53,137
COUT-B	66,384	6,410	668	43	7,121	59,263
COUT-C (Agency and Applicant Preferred Alternative)	53,871	3,555	612	172	4,340	49,532
COUT-H	78,841	14,288	465	54	14,807	64,035
COUT-I	61,224	11,302	459	92	11,852	49,372

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect aspen vegetation communities include:

- coal mining operations
- communication facility
- oil and gas development
- Narrows Reservoir
- Narrows Tunnel
- pipelines
- residential developments
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines

RFFAs in the CIAA that would affect aspen vegetation communities include:

- coal mining operations
- recreation management activities
- residential development
- sand and gravel mining
- TransWest Express Transmission Project
- transportation projects

Aspen vegetation communities in the CIAA occur mostly along the Wasatch Plateau. In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, these aspen vegetation communities have been affected by wildfire and vegetation management activities. Several large fires (the Seeley [2012], Church Camp [2012], and Garder [2002]) and multiple USFS timber sales and salvages have affected large areas of aspen vegetation communities, especially in the CIAA for the COUT-BAX alternative routes and Alternatives COUT-H and COUT- I. Extensive suckering and high growth rates allow aspen vegetation communities to rapidly recover from disturbances.

The extent of Project-related development in aspen vegetation communities would account for a small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-44). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-44).

Barren/Sparsely Vegetated

The loss of barren/sparsely vegetated vegetation communities under all alternative routes would contribute to the cumulative loss of barren/sparsely vegetated vegetation communities in the CIAA. The extent of cumulative development on barren/sparsely vegetated vegetation communities for all relevant alternative routes is summarized in Table 4-45.

TABLE 4-45
BARREN/SPARSELY VEGETATION COMMUNITY
CUMULATIVE EFFECTS SUMMARY IN ACRES

		No Action Alternative				
Alternative Route	**Total Available Resource**	**Past and Present Development**	**Reasonably Foreseeable Future Actions**	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	24,329	499	435	74	1,008	23,321
WYCO-C	33,104	572	554	52	1,178	31,926
WYCO-D	11,819	588	164	6	758	11,061
WYCO-F	25,057	501	403	40	945	24,112
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	131,558	3,874	5,440	269	9,584	121,974
COUT BAX-C	132,742	3,994	8,941	201	13,136	119,606
COUT BAX-E	122,555	4,336	5,906	229	10,471	112,084
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	50,110	3,038	488	92	3,618	46,492
COUT-B	59,084	3,294	268	85	3,648	55,436
COUT-C (Agency and Applicant Preferred Alternative)	73,456	6,560	289	146	6,994	66,461
COUT-H	76,184	6,745	281	135	7,160	69,024
COUT-I	86,395	7,911	350	155	8,417	77,978
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect barren/sparsely vegetated vegetation communities include:

- coal mining operations
- pipelines
- White Sands missile launch facility
- noncoal mining operations
- oil and gas development
- oil shale development
- recreation management activities
- residential development
- Seep Ridge road paving project
- two wind-energy facilities
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines
- Gateway West Transmission Project

RFFAs in the CIAA that would affect barren/sparsely vegetated vegetation communities include:

- coal-mining operations
- oil and gas development
- Woodside power-generation facility
- recreation management activities
- residential development
- TransWest Express Transmission Project
- two wind-energy facilities

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, barren/sparsely vegetated vegetation communities affected by wildfires and vegetation management occur in the CIAA for all alternative routes. Multiple large fires, (Salt Creek [2007], Wolf Den [2012], and Wood Hollow [2012]), and several BLM habitat/rangeland/vegetation management activities, and the Sheep Creek Vegetation Management Area have affected large areas containing barren/sparsely vegetated vegetation communities in the CIAA. Due to the high cover of barren ground in barren/sparsely vegetated communities, fire effects tend to be minimal.

The extent of Project-related development in barren/sparsely vegetated vegetation communities would account for a small portion of total cumulative effects on these areas in the CIAA (Table 4-45). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-45).

Big Sagebrush

The loss of big sagebrush vegetation communities under all alternative routes would contribute to the cumulative loss of big sagebrush vegetation communities in the CIAA. The extent of cumulative development on big sagebrush vegetation communities for all relevant alternative routes is summarized in Table 4-46.

TABLE 4-46
BIG SAGEBRUSH VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	690,168	23,132	13,791	1,671	38,594	651,575
WYCO-C	681,175	23,069	13,043	1,619	37,731	643,444
WYCO-D	869,397	37,271	17,935	2,309	57,515	811,882
WYCO-F	772,152	24,944	17,305	1,902	44,151	728,001
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	226,333	25,710	2,110	633	28,453	197,880
COUT BAX-C	225,446	25,706	2,155	595	28,456	196,991
COUT BAX-E	233,330	22,169	2,043	603	24,815	208,515
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	285,374	21,755	5,887	1,326	28,968	256,407
COUT-B	291,543	19,517	3,924	974	24,414	267,128

TABLE 4-46
BIG SAGEBRUSH VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-C (Agency and Applicant Preferred Alternative)	279,546	22,675	2,755	1,034	26,465	253,080
COUT-H	278,383	29,833	2,061	630	32,524	245,858
COUT-I	295,585	37,337	2,045	868	40,250	255,336

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect big sagebrush vegetation communities include:

- coal-mining operations
- communication facilities
- pipelines
- Utah National Guard training area
- non-coal mining operations
- oil and gas development
- oil shale development
- power generation station
- Carbon County ATV trail
- residential development
- transportation project
- three wind-energy facilities
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines
- Mona South and Gateway West transmission projects
- Narrows Reservoir
- Narrows Tunnel

RFFAs in the CIAA that would affect big sagebrush vegetation communities include:

- coal mining operations
- industrial development
- oil and gas development
- Uinta Express Pipeline
- power generation facilities and storage
- recreation management activities
- residential development
- TransWest Express Transmission Project
- transportation projects
- two wind-energy facilities

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, big sagebrush vegetation communities affected by wildfires and vegetation management occur in the CIAA for all alternative routes. Numerous fires, the largest being Mayberry (2006), Salt Creek (2007), Wolf Den (2012), and Wood Hollow (2012), Winter Valley (2000), and Church Camp (2012), and several BLM habitat/rangeland/vegetation management activities have affected large areas of big sagebrush vegetation communities in the CIAA. Post-disturbance re-establishment occurs through seed germination and may take decades to mature, depending on precipitation, invasion of exotic annual grasses, soil conditions, and fire severity. Therefore, effects from wildfires can persist and account for substantial modification or temporary loss of big sagebrush vegetation communities.

Sagebrush does not resprout from roots following wildfires or vegetation treatments and, as a result, may take decades to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or temporary removal of big sagebrush vegetation communities.

The extent of Project-related development in big sagebrush vegetation communities accounts for a small proportion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-46). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-46).

Grassland

The loss of grassland vegetation communities under all alternative routes would contribute to the cumulative loss of grassland vegetation communities in the CIAA. The extent of cumulative development on grassland vegetation communities for all relevant alternative routes is summarized in Table 4-47.

TABLE 4-47
GRASSLAND VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	11,724	325	140	40	504	11,220
WYCO-C	11,742	325	140	40	504	11,238
WYCO-D	35,120	1,262	350	115	1,726	33,393
WYCO-F	12,354	350	140	40	529	11,825
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	41,473	2,846	377	81	3,303	38,170
COUT BAX-C	42,703	2,949	848	76	3,874	38,829
COUT BAX-E	37,348	2,533	750	63	3,346	34,002
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	7,717	398	66	13	476	7,240
COUT-B	11,666	763	102	31	896	10,770
COUT-C (Agency and Applicant Preferred Alternative)	12,697	1,309	180	57	1,546	11,151
COUT-H	13,503	1,985	177	49	2,211	11,291
COUT-I	19,393	2,612	193	78	2,882	16,511

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect grassland vegetation communities include:

- coal mining operations
- pipelines
- Utah National Guard training area
- White Sands missile launch facility
- non-coal mining operations
- oil and gas development
- oil shale development
- Carbon County ATV trail
- residential development
- transportation projects
- two wind-energy facilities
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines
- Gateway West transmission Project
- Mona South Transmission Project

RFFAs in the CIAA that would affect grassland vegetation communities include:

- coal mining operations
- industrial development
- oil and gas development
- power generation facilities, including a nuclear power plant
- recreation management activities
- residential development
- Hogback Ridge (Whirlwind I) Wind Energy Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, grassland vegetation communities affected by wildfires and vegetation management occur in the CIAA for all alternatives. Numerous fires (the largest being Mayberry [2006], Salt Creek [2007], Wolf Den [2012], Wood Hollow [2012], Winter Valley [2000], and Church Camp [2012] and several BLM habitat/rangeland/vegetation management activities have affected large areas in the CIAA for all alternative routes. Grassland vegetation communities can recover within a decade through resprouting and recruitment, depending on precipitation, fire severity, and invasion of exotic annual grasses. Invasion by exotic grasses has the potential to permanently alter grassland vegetation community structure without active management. As such, wildfires can result in substantial loss or modification of grassland vegetation communities.

The extent of Project-related development in grassland vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-47). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-47).

Montane Forest

The loss of montane forest vegetation communities under COUT BAX and COUT alternative routes would contribute to the cumulative loss of montane forest vegetation communities in the CIAA. The extent of cumulative development on montane forest vegetation communities for all relevant alternative routes is summarized in Table 4-48.

TABLE 4-48
MONTANE FOREST VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	190	0	0	0	0	190
WYCO-C	190	0	0	0	0	190
WYCO-D	5,655	30	3	0	32	5,623
WYCO-F	190	0	0	0	0	190
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	63,615	9,506	76	74	9,657	53,959
COUT BAX-C	63,627	9,506	76	74	9,656	53,971
COUT BAX-E	59,350	7,739	84	12	7,834	51,516
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	38,420	559	1,457	50	2,066	36,355
COUT-B	60,680	2,596	478	18	3,092	57,588
COUT-C (Agency and Applicant Preferred Alternative)	50,368	1,611	304	55	1,970	48,398
COUT-H	58,070	7,936	254	29	8,219	49,851
COUT-I	66,080	13,912	183	104	14,199	51,881

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect montane forest vegetation communities include:

- coal mining operations
- noncoal mining operations
- prescribed fires for the BLM White River Field Office
- oil and gas development
- oil shale development
- pipelines
- residential development
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines
- Narrows Reservoir

RFFAs in the CIAA that would affect montane forest vegetation communities include:

- coal mining operations
- oil and gas development
- residential development
- TransWest Express Transmission Project
- transportation projects
- Hogback Ridge (Whirlwind I) Wind Energy Project

Montane forest vegetation communities occur mostly along the Wasatch and Tavaputs plateaus. In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, several large fires (Seeley [2012], Church Camp [2012], and Garder [2002]) and multiple USFS timber sales and salvages affect montane forest vegetation communities in the CIAA for all COUT and COUT-BAX alternative routes. Wildfires occur naturally within montane forest vegetation communities and may be beneficial. However, the effects of stand-replacing fires and timber removals persist and may account for temporary loss of montane forest vegetation communities.

All impacts on montane forest vegetation communities from Project activities would occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-48). The extent of Project-related development in montane forest vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-48). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-48).

Mountain Shrub

The loss of mountain shrub vegetation communities for Alternative WYCO-D and the COUT BAX and COUT alternative routes would contribute to the cumulative loss of mountain shrub vegetation communities in the CIAA. The extent of cumulative development on mountain shrub vegetation communities for all relevant alternative routes is summarized in Table 4-49.

TABLE 4-49
MOUNTAIN SHRUB VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	699	4	0	0	4	695
WYCO-C	699	4	0	0	4	695
WYCO-D	19,495	1,851	2,869	3	4,724	14,771
WYCO-F	700	5	0	0	5	695
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	91,534	4,280	652	192	5,125	86,410
COUT BAX-C	91,524	4,280	652	191	5,123	86,401
COUT BAX-E	95,525	4,365	738	241	5,344	90,181
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	91,837	1,534	675	283	2,492	89,346
COUT-B	112,856	2,754	942	290	3,986	108,870
COUT-C (Agency and Applicant Preferred Alternative)	109,267	2,495	920	365	3,780	105,488
COUT-H	63,271	4,794	644	177	5,616	57,655
COUT-I	56,671	5,951	535	144	6,631	50,041
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect mountain shrub vegetation communities include:

- coal mining
- a communication facility
- noncoal mining operations

- oil and gas development
- oil shale development
- pipelines
- residential development
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines
- Narrows Reservoir

RFFAs in the CIAA that would affect mountain shrub vegetation communities include:

- coal mining
- oil and gas development
- pipelines
- recreation management activities
- residential development
- TransWest Express Transmission Project
- Squaw Creek Road relocation
- wind-energy facility

Mountain shrub vegetation communities occur mostly along the Wasatch and Tavaputs plateaus with minor occurrences west of the Park Range. In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, several large fires (Seeley [2012], Wood Hollow [2012], and Salt Creek [2007]) and multiple BLM and USFS vegetation management activities (the largest being the Sheep Creek Vegetation Management Area) are in the CIAA for Alternative WYCO-D and all COUT and COUT-BAX alternative routes. Following disturbance, most plant species in mountain shrub vegetation communities resprout and can re-establish rapidly, depending on precipitation and severity. As such, effects from vegetation management and wildfires may result in temporary loss of mountain shrub vegetation communities.

Impacts on mountain shrub vegetation from Alternative WYCO-D would all occur outside areas where past and present actions or RFFAs occur. The extent of Project-related development in mountain shrub vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-49). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-49).

Pinyon-Juniper

The loss of pinyon-juniper vegetation communities under all alternative routes would contribute to the cumulative loss of pinyon-juniper vegetation communities in the CIAA. The extent of cumulative development on pinyon-juniper vegetation communities for all relevant alternative routes is summarized in Table 4-50.

TABLE 4-50
PINYON-JUNIPER VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	73,325	836	351	117	1,304	72,022
WYCO-C	73,327	835	351	115	1,301	72,026
WYCO-D	68,031	1,258	223	71	1,552	66,479
WYCO-F	74,100	858	363	115	1,336	72,765
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	385,582	13,880	3,079	644	17,602	367,980
COUT BAX-C	382,924	13,832	3,941	573	18,345	364,579
COUT BAX-E	365,072	13,624	1,903	556	16,082	348,989
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	179,104	13,284	1,125	413	14,821	164,283
COUT-B	161,824	6,778	1,412	370	8,560	153,264
COUT-C (Agency and Applicant Preferred Alternative)	194,073	8,571	1,453	588	10,612	183,461
COUT-H	213,367	12,390	1,169	352	13,911	199,456
COUT-I	230,570	18,015	1,283	510	19,808	210,763
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA that would affect pinyon-juniper vegetation communities include:

- coal mining
- communication facility
- pipelines
- noncoal mining operations
- oil and gas development
- oil shale development
- Carbon County ATV trail
- residential development
- Gateway West and Mona South transmission projects
- transportation projects
- two wind-energy facilities
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines

RFFAs in the CIAA that would affect pinyon-juniper vegetation communities include:

- coal mining
- industrial development
- oil and gas development
- Uinta Express pipeline
- Woodside power generation facility
- recreation management activities

- TransWest Express Transmission Project
- two wind-energy facilities

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, numerous fires (the largest being Wolf Den [2012] and Wood Hollow [2012]) and several BLM habitat/rangeland/vegetation management activities occur in the CIAA for all alternative routes. Most management activities in pinyon-juniper vegetation communities remove pinyon and juniper trees to prevent encroachment into other vegetation communities. These activities can have a persistent effect on the reduction of pinyon-juniper vegetation communities.

All impacts on pinyon-juniper vegetation communities from Project activities would occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-50). The extent of Project-related development in pinyon-juniper vegetation communities would account for a small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-50). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-50).

Riparian

The loss of riparian vegetation communities under all alternative routes would contribute to the cumulative loss of riparian vegetation communities in the CIAA. The extent of cumulative development on riparian vegetation communities for all relevant alternative routes is summarized in Table 4-51.

TABLE 4-51
RIPARIAN VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	10,593	944	283	32	1,259	9,333
WYCO-C	12,032	994	328	21	1,343	10,689
WYCO-D	15,474	2,725	310	37	3,072	12,403
WYCO-F	11,820	988	342	29	1,359	10,461
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	12,117	4,442	60	14	4,516	7,601
COUT BAX-C	11,835	4,358	506	14	4,878	6,957
COUT BAX-E	11,646	2,161	600	17	2,777	8,869
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	21,224	4,133	675	62	4,869	16,355
COUT-B	12,675	2,749	115	24	2,888	9,786
COUT-C (Agency and Applicant Preferred Alternative)	12,203	1,413	51	16	1,480	10,722
COUT-H	9,920	1,549	27	6	1,582	8,337
COUT-I	14,311	4,593	41	10	4,643	9,667

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect riparian vegetation communities include:

- coal mining
- communication facility
- pipelines
- noncoal mining operations
- oil and gas development
- oil shale development
- Carbon County ATV trail
- residential development
- two wind-energy facilities
- Gateway West Transmission Project
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines

RFFAs in the CIAA that would affect riparian vegetation communities include:

- coal mining
- industrial development
- a diversion dam
- oil and gas development
- Uinta Express pipeline
- Woodside power generation station
- residential development
- TransWest Express Transmission Project
- a wind-energy facility

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, numerous fires (the largest being Salt Creek [2007] and Nebo Creek [2001]) and several BLM vegetation management activities occur in the CIAA for all alternative routes. These vegetation communities are naturally resistant to fire and experience minimal direct effects from wildfires, but may be affected by associated increases in erosion and runoff.

All impacts on riparian vegetation communities from Project activities would occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-51). The extent of Project-related development in riparian vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-51). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-51).

Shrub/Shrub Steppe

The loss of shrub/shrub steppe vegetation communities under all alternative routes would contribute to the cumulative loss of shrub/shrub steppe vegetation communities in the CIAA. The extent of cumulative development on shrub/shrub steppe vegetation communities for all relevant alternative routes is summarized in Table 4-52.

TABLE 4-52
SHRUB/SHRUB STEPPE VEGETATION COMMUNITY
CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	360,242	14,370	9,946	1,076	25,392	334,850
WYCO-C	427,124	16,195	11,581	1,083	28,859	398,265
WYCO-D	245,575	14,528	8,208	554	23,290	222,286
WYCO-F	377,763	14,825	11,504	921	27,251	350,512
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	522,635	31,733	11,800	1,285	44,817	477,818
COUT BAX-C	556,949	33,460	23,027	1,205	57,692	499,257
COUT BAX-E	532,359	32,778	19,328	1,413	53,519	478,840
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	123,701	12,624	1,080	412	14,116	109,584
COUT-B	148,516	19,285	1,270	325	20,880	127,635
COUT-C (Agency and Applicant Preferred Alternative)	246,956	36,123	1,962	650	38,735	208,221
COUT-H	253,017	36,521	1,973	640	39,134	213,883
COUT-I	339,386	46,255	2,506	1,016	49,777	289,609

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect shrub/shrub steppe vegetation communities include:

- coal mining
- communication facility
- pipelines
- industrial development
- Utah National Guard military training area
- White Sands missile launch facility
- non-coal mining operations
- oil and gas development
- oil shale development
- power generation
- Carbon County ATV trail
- residential development
- transportation projects
- three wind-energy facilities
- Mona South, and Gateway West transmission projects
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences and waterlines)
- BLM White River Field Office range improvement lines

RFFAs in the CIAA that would affect shrub/shrub steppe vegetation communities include:

- coal mining
- industrial development
- Uinta Express pipeline
- oil and gas development
- power generation projects
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, numerous fires (the largest being Wolf Den [2012] and Winter Valley [2000]) and several BLM vegetation management activities occur in the CIAA for all alternative routes. Post-disturbance re-establishment occurs through seed germination and may take decades to mature depending on precipitation, invasion of exotic annual grasses, soil conditions, and fire severity. Therefore, effects from wildfires can persist and account for substantial modification or temporary loss of shrub/shrub steppe vegetation communities.

All impacts on shrub/shrub steppe vegetation communities from Project activities would occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-52). The extent of Project-related development in shrub/shrub steppe vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-52). All cumulative effects, including those from the Project, affect a moderate amount of the total extent of these vegetation communities in the CIAA (Table 4-52).

Water

The loss of water vegetation communities for all alternative routes would contribute to the cumulative loss of water vegetation communities in the CIAA. The extent of cumulative development on water vegetation communities for all relevant alternative routes is summarized in Table 4-53.

TABLE 4-53
WATER VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	6,559	215	21	8	243	6,316
WYCO-C	6,892	218	15	7	239	6,653
WYCO-D	6,831	619	29	6	654	6,178
WYCO-F	6,786	280	27	6	313	6,473
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	4,098	684	72	4	759	3,339
COUT BAX-C	4,185	687	81	2	770	3,415
COUT BAX-E	4,570	741	68	3	813	3,757

TABLE 4-53
WATER VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	10,491	1,587	9	6	1,602	8,889
COUT-B	4,043	964	13	5	982	3,062
COUT-C (Agency and Applicant Preferred Alternative)	3,243	229	11	3	243	3,000
COUT-H	5,176	334	9	6	349	4,827
COUT-I	5,358	591	9	4	604	4,754

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect water vegetation communities include:

- coal-mining operations
- pipelines
- noncoal mining operations
- oil and gas development
- oil shale development
- residential development
- two wind-energy facilities
- Gateway West Transmission Project
- fences and water range improvement projects for the BLM White River Field Office

RFFAs in the CIAA that would affect water vegetation communities include:

- coal mining
- oil and gas development
- Uinta Express pipeline
- power generation facilities
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, numerous fires (the largest being Salt Creek [2007], Seeley [2012], and Church Camp [2012] and several BLM vegetation management activities occur in the CIAA for all alternative routes. These vegetation communities are naturally resistant to fire and experience minimal direct effects from wildfires, but may be affected by associated increases in erosion and runoff.

All impacts on water vegetation communities from Project activities would occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-53). The extent of Project-related development in water vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-53). All cumulative effects, including those from the Project, affect a moderate portion of the total extent of these vegetation communities in the CIAA (Table 4-53).

Wetland

The loss of wetland vegetation communities under the WYCO and COUT-BAX alternative routes and Alternatives COUT-A and COUT-B would contribute to the cumulative loss of wetland vegetation communities in the CIAA. The extent of cumulative development on wetland vegetation communities for all relevant alternative routes is summarized in Table 4-54.

TABLE 4-54
WETLAND VEGETATION COMMUNITY CUMULATIVE EFFECTS SUMMARY IN ACRES

		No Action Alternative				
Alternative Route	**Total Available Resource**	**Past and Present Development**	**Reasonably Foreseeable Future Actions**	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)						
WYCO-B (Agency and Applicant Preferred Alternative)	10,862	1,016	283	15	1,315	9,548
WYCO-C	11,358	1,000	230	25	1,255	10,103
WYCO-D	15,126	5,471	298	11	5,780	9,346
WYCO-F	12,003	1,099	336	16	1,451	10,552
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)						
COUT BAX-B	546	173	9	1	183	364
COUT BAX-C	553	176	9	1	185	368
COUT BAX-E	660	183	12	1	195	464
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)						
COUT-A	7,688	6,204	26	4	6,235	1,453
COUT-B	7,137	5,281	64	14	5,360	1,778
COUT-C (Agency and Applicant Preferred Alternative)	238	34	1	0	35	203
COUT-H	273	58	1	0	60	214
COUT-I	272	89	1	0	91	182

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect wetland vegetation communities include:

- coal mining
- oil and gas development
- Gateway West Transmission Project
- two wind-energy facilities

RFFAs in the CIAA that would affect wetland vegetation communities include:

- coal mining
- Uinta Express pipeline
- oil and gas development
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, numerous fires, the largest being Church Camp (2012), and several BLM vegetation management activities occur in the CIAA for all alternative routes. These vegetation communities are naturally resistant to fire and experience minimal direct effects from wildfires, but may be affected by associated increases in erosion and runoff.

All impacts on wetland vegetation communities from Project activities would occur with past and present actions or RFFAs to some degree, though Project-related impacts also would occur outside these areas with all alternative routes (Table 4-54). The extent of Project-related development in wetland vegetation communities would account for a very small portion of total cumulative effects in areas with past and present activities in the CIAA (Table 4-54). All cumulative effects, including those from the Project, affect a considerable portion of the total extent of these vegetation communities in the CIAA (Table 4-54).

4.3.6 Special Status Plants

This section addresses cumulative effects on special status plant resources resulting from the Project in addition to other past and present actions and RFFAs. Resources addressed in this section are the same as those described in Section 3.2.6.

The approach for analysis of cumulative effects on special status plants, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative effects analysis for special status plants considers past and present actions and RFFAs (Tables 4-1 and 4-2) in conjunction with direct and indirect impacts from the Project (described in Section 3.2.6.4.3).

The geographic scope of the CIAA for an alternative route that crosses special status plant habitat is the extent of subwatersheds (12-digit HUCs) crossed by the alternative routes considered. The analysis area is sufficient to analyze all potential cumulative effects of the Project on federally listed or candidate species; however, sufficient habitat and occurrence data are not available for USFS- and BLM-listed sensitive species across the Project area and, therefore, quantitative analysis of cumulative impacts on these species is not possible for the purposes of this EIS. Cumulative effects on USFS-listed sensitive plant species are addressed in the Biological Evaluation available on the BLM website for the Project and Vegetation and Special Status Plants Report (USFS 2015a).

Most direct cumulative impacts on special status plants associated with construction of the Proposed Action would occur in the immediate geographical area of construction activities for access roads, tower structures, and ancillary facilities. However, some anticipated direct and indirect effects (described in Section 3.2.6.4.3), such as the introduction and spread of noxious weed species and increased dust deposition, could occur in a larger geographical context as well as in the immediate vicinity of construction activities.

The temporal scope of the analysis includes 5 years for impacts associated with Project construction and site stabilization. The Proposed Action does not include plans to decommission the Project; therefore, the temporal scope of analysis for impacts associated with operation and maintenance of the Project is based on the assumption that the effects of operating and maintaining the transmission line would persist for the life of the Project (50 years or longer). Because the Proposed Action does not include decommissioning (refer to Section 2.4.9), long-term impacts associated with the presence of the transmission line (e.g., tower foundations) may be permanent.

4.3.6.1 Issues Identified for Analysis

4.3.6.1.1 Loss and Degradation of Habitat for Special Status Plant Species

Loss of special status plant habitat was identified as an issue warranting analysis by the agencies and public during scoping (Table 4-3). Loss of special status plant habitat could occur with construction of access roads, tower structures, and ancillary facilities in these areas. Loss of habitat for special status plant species is more likely to negatively affect a species if impacts are extensive, occur over a significant portion of available habitat, or affect patchy or isolated populations. Cumulative loss of habitat are analyzed qualitatively for all special status species and quantitatively for federally listed, candidate, and proposed species in Section 4.3.6.

4.3.6.1.2 Long-term Sustainability of Special Status Plant Populations

Negative impacts on long-term sustainability of special status plant populations was identified as an issue relating to special status plant resources by the agencies and during public scoping (Table 4-3). Long-term sustainability of some special status plant populations could be threatened through cumulative detrimental direct and indirect impacts of past and present actions and RFFAs to populations and potential habitat. Impacts on habitat could result in habitat fragmentation, which could limit gene flow between populations, decrease genetic diversity in populations, and potentially have a negative impact on long-term population viability (Ellstrand and Elam 1993). These impacts could be particularly threatening to long-term sustainability of special status plant resources if impacts are extensive, occur over a significant portion of available habitat, or affect populations that are already especially patchy or isolated. Cumulative impacts on habitat for special status plants are analyzed in terms of direct impacts on special status plant habitat (i.e., decrease in extent [in acres] of habitat) and are discussed quantitatively in Section 4.3.6.

4.3.6.2 Existing Condition

Conversion of native vegetation to agricultural use since settlement of European peoples in the area in the middle of the nineteenth century has significantly affected the character of landscapes and the quantity and quality of habitats for special status plants in the CIAA. Construction of settlements and transportation systems as well as human population growth have resulted in further conversion of habitats for plants and animals and significant shifts in the abundance and distribution of species of the area. Drought, wildfire, climate change, introduction of noxious weeds, and anthropogenic disturbance have likewise resulted in changes to habitats in more recent times.

Cumulative effects analysis and results are based on the best available species-specific habitat information. Descriptions of existing conditions of special status plants are provided in Section 3.2.5.5. Species accounts for special status plant species are presented in Appendix J.

4.3.6.3 Results

Direct loss of special status plant habitat could result from ground-disturbing activities or construction of permanent or temporary features. Indirect negative impacts on habitat (i.e., habitat degradation) also could occur where disturbance is adjacent to habitat but does not affect it directly. Degradation could be a result of many factors, including changes to erosional patterns, dust deposition from increased traffic, decreased attractiveness of the area to pollinators, and noxious weed invasion (refer to Section 3.2.5.4 for more detailed information).

Past actions in the CIAA—such as residential development, mining operations, oil and gas development, pipelines, and oil shale and tar sands development—have resulted in the loss or degradation of special status plant habitat. Unsustainable grazing practices and other soil-disturbing activities, as well as transport of weed seeds via human and livestock movement, likely have resulted in large-scale invasion of this area by noxious and invasive weeds. Present actions also are likely to result in loss or degradation of special status plant habitat, though it is assumed that selective mitigation measures and/or federal or agency regulation would ensure the minimization of these impacts. Inadvertent habitat degradation in areas adjacent to ground-disturbing actions also are likely to occur with present actions, even though selective mitigation measures to minimize these impacts would be required on federal land.

Construction of Project features such as access roads, transmission towers, and ancillary facilities would require the permanent removal of vegetation and could result in the loss of potential habitat for special status plants under all action alternative routes. Non-native plant species are likely to colonize new areas through the transport of seeds by construction and maintenance equipment. Revegetation of disturbed areas is a design feature of the Proposed Action for environmental protection (refer to Table 2-8, Design Feature 2); however, it is unlikely that disturbed areas could be restored to predisturbance conditions. As site-specific Project-related impacts on habitats and populations of BLM- and USFS-listed sensitive species are not known, it is not possible to quantify cumulative effects on these species. However, it is assumed that application of Design Features 3 and 9(Table 2-8) and Selective Mitigation Measures 2 and 7 (Table 2-13) would minimize disturbance to special status plant species habitat and populations. Impacts on habitat for special status plants, however minimal, would contribute incrementally to losses of special status plant habitat that have occurred or could occur in the CIAA. RFFAs that require the construction of long-term or permanent Project structures or that introduce non-native plant species also would be likely to result in changes to vegetation community structure and the degradation of potential habitat for special status plants.

Quantitative analysis of cumulative effects on special status plant resources was completed through an inventory of available habitat for each species and an estimation of impacts in these habitats by past and present actions and the Proposed Action and other RFFAs. Areas affected by wildfires were excluded from the quantitative analysis as vegetation communities can recover from these events. Recovery from wildfires depends on the time since the occurrence, precipitation amounts, plant species, and degree of associated degradation (weed invasion, soil loss, and fire intensity). Vegetation management areas were also excluded for similar reasons; additionally, these areas were assumed to have beneficial effects. The extent of special status plant habitats (in acres) in the CIAA was determined using information provided by land-management agencies. Development associated with past and present actions and RFFAs was estimated using shapefiles of specific projects received from agencies and local governments. Incremental project development was estimated using assumptions of the extent of disturbance per mile of alternative routes as described in Section 2.5.1.2.

Predicted cumulative effects were analyzed for species for which direct impacts would be anticipated to occur with implementation of any action alternative considered (refer to Section 3.2.6). The results of this analysis are presented by species.

4.3.6.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

The WYCO alternative routes only cross habitat for Ute ladies’-tresses.

Ute Ladies’-tresses

The incremental Project-related impacts resulting in loss, fragmentation, and modification of Ute ladies’-tresses habitat under all WYCO alternative routes would contribute to the cumulative loss, fragmentation, and modification of Ute ladies’-tresses habitat. The extent of cumulative development on Ute ladies’-tresses habitat is summarized in Table 4-55.

TABLE 4-55
UTE LADIES'-TRESSES HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	14,340	1,448	216	5	1,668	12,671
WYCO-C	16,380	1,465	288	5	1,757	14,623
WYCO-D	24,282	7,617	309	12	7,938	16,344
WYCO-F	16,385	1,571	304	10	1,884	14,501
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present activities in the CIAA for all WYCO alternative routes that would affect Ute ladies'-tresses potential habitat include:

- coal-mining operations
- Atlantic Rim oil and gas field
- BLM Little Snake and White River Field Office oil and gas units
- Colorado and Wyoming state lands oil and gas leases
- expansion of the Chokecherry Wind Farm
- construction of the Seven Mile Hill Wind Energy Facility
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences, cattle guards, gates, waterlines)
- Gateway West Transmission Project

RFFAs in the CIAA for Ute ladies'-tresses potential habitat include:

- coal-mining operations
- Continental Divide-Creston Junction oil and gas project
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

Ute ladies' tresses potential habitat within the CIAA for all WYCO alternative routes is largely unaffected by historic wildfires and vegetation management activities.

The incremental project-related development in Ute ladies'-tresses potential habitat would account for only a minor portion (between 5 and 12 acres) of the total cumulative effects predicted in the CIAA for the WYCO alternative routes considered (Table 4-55).

4.3.6.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

All COUT BAX alternative routes cross potential habitat for Ute ladies'-tresses and Cisco milkvetch, and Alternative COUT BAX-C crosses San Rafael cactus habitat.

Ute Ladies'-tresses

The incremental project-related impacts resulting in loss, fragmentation, and modification of Ute ladies'-tresses habitat under all COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and modification of Ute ladies'-tresses habitat in the CIAA. The extent of cumulative development in Ute ladies'-tresses habitat is summarized in Table 4-56.

TABLE 4-56
UTE LADIES'-TRESSES HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	11,977	4,555	45	15	4,615	7,362
COUT BAX-C	11,690	4,474	498	14	4,986	6,704
COUT BAX-E	11,190	2,258	594	16	2,868	8,322
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

- coal-mining operations
- Central Utah Telephone Fiber Optic Line
- SITLA active humic shale, metalliferous mineral, and potash leases
- BLM Grand Junction, Moab, and White River Field Office active oil and gas extraction leases
- SITLA active oil and gas extraction leases
- Ferron natural gas project
- Enterprise Mid-America pipelines
- residential development
- Narrows Proposed East Bench and Oak Creek pipeline

RFFAs in the CIAA for all COUT BAX alternative routes that would affect Ute ladies'-tresses potential habitat include:

- Golden Eagle, LLC oil and gas development
- Twin Bridges Resources oil and gas development
- Woodside power generation facility
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, potential habitat for Ute ladies' tresses in the CIAA may have been affected by historic wildfires or vegetation management activities for all COUT-BAX alternative routes. Two fires (Westwater [2006] and Salt Creek [2012]) burned in areas near potential Ute ladies' tresses habitat. While the species grows in wetland habitats that are less likely to burn in fire events, these habitats may be affected by subsequent sedimentation from adjacent burned upland habitats or damaged by high flow events.

The incremental project-related development in Ute ladies'-tresses potential habitat would account for only a minor portion (between 14 and 16 acres) of the total cumulative effects predicted in the CIAA for the COUT BAX alternative routes considered (Table 4-56).

Cisco Milkvetch

The incremental project-related impacts resulting in loss, fragmentation, and modification of Cisco milkvetch habitat for all COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and modification of Cisco milkvetch habitat in the CIAA. The extent of cumulative development in Cisco milkvetch habitat for the relevant alternative routes is summarized in Table 4-57.

TABLE 4-57
CISCO MILKVETCH HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	146,502	3,856	915	475	5,246	141,256
COUT BAX-C	146,502	3,856	915	475	5,243	141,259
COUT BAX-E	146,502	3,856	915	468	5,239	141,263

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA for all COUT BAX alternative routes that would affect Cisco milkvetch habitat include:

- SITLA active humic shale and potash leases
- BLM Moab Field Office oil and gas units
- SITLA active oil and gas extraction leases
- Enterprise Mid-America pipelines

The only RFFAs in the CIAA for the COUT BAX alternative routes that would affect Cisco milkvetch habitat is the TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, potential habitat for Cisco milkvetch in the CIAA for all COUT-BAX alternative routes has also been affected by historic wildfires occurs. Four small fires account for all of these effects and only affect small areas of potential habitat for Cisco milkvetch.

The incremental project-related development in Cisco milkvetch habitat would account for a moderate portion (between 468 and 475 acres) of the total cumulative effects predicted in the CIAA for the COUT BAX alternative routes considered (Table 4-57).

San Rafael Cactus

Alternatives COUT BAX-B and COUT BAX-C cross San Rafael cactus habitat. Impacts on San Rafael cactus habitat would not contribute to the cumulative loss, fragmentation, and modification of San Rafael cactus habitat in the CIAA for these alternative routes as all areas where the Project would affect habitat for this species are in the extent of past and present actions and RFFAs (Table 4-58). The extent of cumulative development on San Rafael cactus habitat for all relevant alternative routes is summarized in Table 4-58.

TABLE 4-58
SAN RAFAEL CACTUS HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	3,594	69	22	0	91	3,503
COUT BAX-C	3,865	75	22	0	96	3,769
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Existing roads and transmission lines in the COUT BAX-B and COUT BAX- C CIAAs account for the majority of total cumulative development in San Rafael cactus habitat.

The only RFFA in the CIAA for Alternatives COUT BAX-B and COUT BAX- C that would affect San Rafael cactus habitat is the TransWest Express Transmission Project.

No potential San Rafael cactus habitat in the CIAA for any of COUT-BAX alternative routes has been affected by historic wildfires or vegetation management activities. UDWR watershed restoration focus areas occur in the CIAA, but any adverse effect from these activities will be minimal.

All project development in San Rafael cactus habitat in the CIAA would occur in the same geographic areas of past or present actions or other RFFAs. Therefore, the analysis conducted predicts no incremental Project-related development in San Rafael cactus habitat in the CIAA for Alternatives COUT BAX- B and COUT BAX- C. However, whether the Project would incrementally contribute to the effects on this species would be dependent on the degree to which individuals and habitat could be avoided during the design of the Project. Colocating Alternatives COUT BAX-B and COUT BAX- C with the TransWest Express Transmission Project and existing transmission lines would help reduce the effects on this species. However, the cumulative effects analysis found that up to 22 acres of habitat for this species could be affected.

4.3.6.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Ute ladies'-tresses potential habitat are crossed by all COUT alternative routes. Alternatives COUT-A, COUT-B, and COUT-C cross clay phacelia habitat. Clay reed-mustard and Uinta Basin hookless cactus habitat (as well as Levels 1 and 2 *Sclerocactus* core habitat) are crossed by Alternatives COUT-C, COUT-H, and COUT-I. Graham's beardtongue and White River beardtongue habitat are crossed by Alternatives COUT-B, COUT-C, COUT-H, and COUT-I.

Ute Ladies'-tresses

The incremental Project-related impacts resulting in loss, fragmentation, and modification of Ute ladies'-tresses habitat under all COUT alternative routes would contribute to the cumulative loss, fragmentation, and modification of Ute ladies'-tresses habitat in the CIAA for these alternative routes. The extent of cumulative development on Ute ladies'-tresses habitat is summarized in Table 4-59.

TABLE 4-59
UTE LADIES'-TRESSES HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	20,363	10,484	98	28	10,611	9,752
COUT-B	17,894	7,980	154	40	8,174	9,720
COUT-C (Agency and Applicant Preferred Alternative)	10,484	1,401	21	14	1,437	9,047
COUT-H	9,782	1,563	20	10	1,593	8,189
COUT-I	14,672	4,614	35	14	4,662	10,010

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

The largest extent of potential habitat for Ute-ladies'-tresses occurs in the cumulative effects analysis areas of Alternatives COUT-A and COUT-B. Lesser extents of potential habitat for Ute-ladies'-tresses occur in the cumulative effects analysis areas of Alternatives COUT-C, COUT-H, and COUT-I.

Past and present activities in the CIAA for all COUT alternative routes that would affect Ute ladies'-tresses potential habitat include:

- coal-mining operations
- the Central Utah Telephone fiber optic line
- two pipelines
- gilsonite mining
- SITLA active limestone and metalliferous mineral leases
- BLM Vernal Field Office oil and gas units
- Chapita Wells/Stagecoach oil and gas units
- Greater Deadman Bench oil and gas units
- Greater Natural Buttes Area gas development project oil and gas units
- Gusher Oil & Gas project oil and gas units
- Lake Canyon Exploration and Development Agreement (EDA) oil and gas units
- Colorado state land oil and gas leases
- UDOGM oil well pads
- recreation management activities
- residential development
- Narrows Proposed East Bench and Oak Creek Pipeline

RFFAs in the CIAA that would affect Ute ladies'-tresses potential habitat include:

- Kerr-McGee oil and gas development
- Monument Butte oil and gas development
- industrial development
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, potential habitat for Ute ladies' tresses in the CIAA may have been affected by historic wildfires or vegetation management activities for all COUT alternative routes. Two fires (Nebo Creek [2001] and Salt

Creek [2012]) burned in areas near potential Ute ladies' tresses habitat. While the species grows in wetland habitats that are less likely to burn in fire events, these habitats may be affected by subsequent sedimentation from adjacent burned upland habitats or damaged by high flow events.

The incremental Project-related development in potential habitat for Ute ladies'-tresses would account for only a minor portion (between 10 and 40 acres) of the total cumulative effects predicted in the CIAA for the COUT alternative routes considered (Table 4-59).

Clay Phacelia

Alternatives COUT-A, COUT-B, and COUT-C cross clay phacelia habitat. Impacts on clay phacelia habitat would contribute to the cumulative loss, fragmentation, and modification of clay phacelia habitat in the CIAA for these alternative routes. The extent of cumulative development on clay phacelia habitat for all relevant alternative routes is summarized in Table 4-60.

TABLE 4-60
CLAY PHACELIA HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	535	19	6	1	26	509
COUT-B	1,283	65	31	7	104	1,179
COUT-C (Agency and Applicant Preferred Alternative)	1,283	65	31	8	104	1,179

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA for these alternative routes that would affect clay phacelia habitat include:

- D&RGW Railways
- Mona to Bonanza 345 kV transmission line
- Spanish Fork 345 kV and 138 kV transmission lines
- Uinta-Wasatch-Cache National Forest range improvement projects (i.e., fences, waterlines, stream crossings, troughs)

The RFFAs in the CIAA that would affect clay phacelia habitat include:

- TransWest Express Transmission Project

In addition to the past, present and RFFAs quantitatively analyzed in this section, and a small wildfire and the Sheep Creek vegetation management area may have affected potential clay phacelia habitat in the CIAA for Alternatives COUT-A, COUT-B and COUT-C. Any effects from these events should be minimal as the fire burned very minor portions of potential habitat and the USFS activities in the Sheep Creek vegetation management area avoid clay phacelia habitat.

The FWS has expressed concern about the potential effects of additional development to suitable and occupied clay phacelia habitat, including the construction and operation of the Energy Gateway South and TransWest Express transmission lines. Most Project development in clay phacelia habitat in the CIAA would occur in the same geographic areas of past or present actions or other RFFAs with the majority being in the Sheep Creek vegetation management area for the Uinta-Wasatch-Cache National Forest.

Of the 1,348 acres of USFS modeled habitat, roughly 40 percent and 95 percent is contained in the CIAA for Alternative COUT-A and Alternatives COUT-B and COUT-C, respectively. Total cumulative development affects less than 10 percent of potential suitable habitat in the relevant CIAA (4.9 percent for Alternative COUT-A and 8.4 percent for Alternatives COUT-B and COUT-C). Development associated with the Project would contribute between 3.8 percent and 7.7 percent to the total estimated cumulative development and would affect between 0.2 percent and 0.6 percent of modeled potential habitat in the relevant CIAAs. The contribution of the Project to effects on clay phacelia along these alternative routes would depend on the degree of colocation with other planned and existing transmission lines and the amount of habitat that could be avoided during construction of the Project. Under any action alternative, the majority of the available clay phacelia would be unaffected by past, present, and reasonably foreseeable future development. Therefore, incremental Project-related development anticipated in clay phacelia habitat in the CIAA for any COUT alternative route would be minor.

Clay Reed-mustard

The incremental Project-related impacts resulting in loss, fragmentation, and modification of clay reed-mustard habitat for Alternatives COUT-C, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of clay reed-mustard habitat in the CIAA for this species. The extent of cumulative development on clay reed-mustard habitat for all relevant alternative routes is summarized in Table 4-61.

TABLE 4-61
CLAY REED-MUSTARD HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-C (Agency and Applicant Preferred Alternative)	37,077	2,179	94	73	2,346	34,731
COUT-H	37,077	2,179	94	73	2,345	34,732
COUT-I	37,077	2,179	94	71	2,344	34,733

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect clay reed-mustard habitat include:

- BLM Vernal Field Office oil and gas units
- Gasco oil and gas development
- Greater Natural Buttes area gas development
- Riverbend Unit infill oil and gas units
- SITLA active oil and gas leases
- SITLA active metalliferous mineral leases
- UDOGM gas well pads
- gilsonite mining operations

The only RFFA in the CIAA for these alternative routes that would affect clay reed-mustard habitat is the TransWest Express Transmission Project.

Potential clay reed-mustard habitat in the CIAA for any COUT alternative route is largely unaffected by historic wildfires or vegetation management activities.

The incremental Project-related development in clay reed-mustard habitat would account for only a minor portion (71 to 73 acres) of the total cumulative effects predicted in the CIAA for the COUT alternative routes considered (Table 4-61).

Graham's Beardtongue

The incremental Project-related impacts resulting in loss, fragmentation, and modification of Graham's beardtongue habitat for Alternatives COUT-B and COUT-C, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Graham's beardtongue habitat. The extent of cumulative development on Graham's beardtongue habitat for all relevant alternative routes is summarized in Table 4-62.

TABLE 4-62
GRAHAM'S BEARDTONGUE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-B	38,005	2,017	707	89	2,813	35,191
COUT-C (Agency and Applicant Preferred Alternative)	89,588	4,395	550	135	5,080	84,508
COUT-H	89,323	4,365	530	111	5,006	84,317
COUT-I	89,323	4,365	530	110	5,004	84,319

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect Graham's beardtongue habitat include:

- SITLA active metalliferous mineral leases and mineral materials permits
- Berry Petroleum South Unit oil and gas development
- BLM Price, Vernal, and White River Field Office oil and gas units
- Gasco oil and gas units, Lake Canyon EDA oil and gas units
- Rye Patch oil drilling project oil and gas development
- SITLA active oil and gas and oil shale leases
- West Tavaputs Plateau oil and gas development
- Red Leaf Oil Shale Project development
- residential development

The RFFAs in the CIAA that would affect Graham's beardtongue habitat include:

- TransWest Express Transmission Project

In addition to the past, present and RFFAs analyzed quantitatively in this section, potential habitat for Graham's beardtongue in the CIAA for all COUT alternative routes has been affected by historic wildfires and vegetation management. Two large fires (Church Camp [2012] and Garder [2002]) affect small areas of potential habitat in the CIAA for Alternatives COUT-B, COUT-C, COUT-H, and COUT-I. BLM vegetation management activities affect even smaller areas in the CIAA for Alternative COUT- B. Fire disturbance effects should be minimal due to the low vegetation cover in potential Graham's beardtongue habitat.

The incremental Project-related development in Graham's beardtongue habitat would account for only a minor portion (89 to 135 acres) of the total cumulative effects predicted in the CIAA for all COUT alternative routes (Table 4-62).

Uinta Basin Hookless Cactus

The loss, fragmentation, and modification of Uinta Basin hookless cactus habitat under Alternatives COUT-C, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Uinta Basin hookless cactus habitat. The extent of cumulative development on Uinta Basin hookless cactus habitat for all relevant alternative routes is summarized in Table 4-63.

TABLE 4-63
UINTA BASIN HOOKLESS CACTUS HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-C (Agency and Applicant Preferred Alternative)	223,055	34,639	1,398	482	36,519	186,536
COUT-H	223,055	34,639	1,398	478	36,515	186,540
COUT-I	223,055	34,639	1,398	470	36,507	186,548

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect Uinta Basin hookless cactus habitat include:

- gilsonite mining operations
- SITLA active metalliferous mineral leases
- BLM Vernal Field Office oil and gas units
- Chapita Wells/Stagecoach oil and gas development
- North Chapita Wells oil and gas development
- Gasco oil and gas development
- Greater Deadman Bench oil and gas development
- Greater Natural Buttes area gas development
- North Alger oil and gas development
- Riverbend Unit infill oil and gas development
- SITLA active oil and gas and oil shale leases
- the Red Leaf oil shale project
- Peter's Point Loop pipeline
- Seep Ridge Road paving project

RFFAs in the CIAA that would affect Uinta Basin hookless cactus habitat include:

- TransWest Express Transmission Project
- Monument Butte EIS oil and gas development
- Kerr-McGee oil and gas development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, Uinta Basin hookless cactus habitat in the CIAA for Alternatives COUT-C, COUT-H, and COUT- I has been affected by a small wildfire. As this fire affected a very minor portion of potential habitat and potential habitat has low vegetation cover, the effects should be minimal.

The incremental Project-related development in Uinta Basin hookless cactus habitat would account for a moderate portion (between 470 and 482 acres) of the total cumulative effects predicted in the CIAA for the COUT alternative routes considered (Table 4-63).

Level 1 (400-Meter) *Sclerocactus* Core Habitat

The loss, fragmentation, and modification of Level 1 *Sclerocactus* core habitat for Alternatives COUT-C, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Level 1 *Sclerocactus* core habitat. The extent of cumulative development on Level 1 *Sclerocactus* core habitat for all relevant alternative routes is summarized in Table 4-64.

TABLE 4-64
LEVEL 1 SCLEROCACTUS CORE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-C (Agency and Applicant Preferred Alternative)	20,564	2,961	66	21	3,049	10,515
COUT-H	20,564	2,961	66	21	3,048	17,516
COUT-I	20,564	2,961	66	20	3,048	17,516

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA for Level 1 *Sclerocactus* core habitat include:

- gilsonite mining operations
- SITLA active metalliferous mineral leases
- BLM Vernal Field Office oil and gas units
- Chapita Wells/Stagecoach oil and gas development
- North Chapita Wells oil and gas development
- Gasco oil and gas development
- Greater Natural Buttes area gas development
- Riverbend Unit infill oil and gas development
- SITLA active oil and gas and oil shale leases
- UDOGM gas well pads

RFFAs in the CIAA for Uinta Basin hookless cactus include:

- TransWest Express Transmission Project
- Monument Butte EIS oil and gas development
- Kerr-McGee oil and gas development

The incremental Project-related development in Level 1 *Sclerocactus* core habitat would account for only a minor portion (approximately 20 acres) of the total cumulative effects predicted in the CIAA for Alternatives COUT-C, COUT-H, and COUT-I (Table 4-64).

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, Level 1 *Sclerocactus* core habitat in the CIAA for Alternatives COUT-C, COUT-H and COUT-I has been affected by a small wildfire. As this fire affected a very minor portion of potential habitat and potential habitat has low vegetation cover, the effects should be minimal.

The FWS has recommended that Level 1 *Sclerocactus* core habitat areas be managed to exclude additional ground disturbance (FWS 1990). The Project and other RFFAs would result in additional ground disturbance in Level 1 *Sclerocactus* core habitat areas and would, therefore, not be consistent with FWS management recommendations. The effects of the Project and other RFFAs would contribute approximately 4 percent (approximately 87 acres) of the total estimated cumulative ground disturbance in Level 1 *Sclerocactus* core habitat areas, and ground disturbance resulting from the Project would only range be approximately 20 acres (approximately 35 percent) of the disturbance resulting from all RFFAs. The methods used to evaluate ground disturbance in *Sclerocactus* core habitats may overestimate the amount of ground disturbance in the CIAA from the Project and other past and present actions and RFFAs. All actions in Level 1 *Sclerocactus* core habitat areas would be managed to minimize effects on individual cacti and their habitats. Micro-siting of Project features and other selective mitigation measures as described in Sections 3.2.6.4.3 and 3.2.6.5.4 and would minimize impacts in Level 1 *Sclerocactus* core areas.

Level 2 (1,000-Meter) *Sclerocactus* Core Habitat

The loss, fragmentation, and modification of Level 2 *Sclerocactus* core habitat for Alternatives COUT-C, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of Level 2 *Sclerocactus* core habitat. The extent of cumulative development on Level 2 *Sclerocactus* core habitat for all relevant alternative routes is summarized in Table 4-65.

TABLE 4-65
LEVEL 2 SCLEROCACTUS CORE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-C (Agency and Applicant Preferred Alternative)	65,353	9,379	281	107	9,766	55,587
COUT-H	65,353	9,379	281	105	9,765	55,588
COUT-I	65,353	9,379	281	104	9,763	55,590

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA for Level 2 *Sclerocactus* core habitat include:

- gilsonite mining operations
- SITLA active metalliferous mineral leases
- BLM Vernal Field Office oil and gas units
- Chapita Wells/Stagecoach oil and gas development
- North Chapita Wells oil and gas development
- Gasco oil and gas development
- Greater Deadman Bench oil and gas development
- Greater Natural Buttes area gas development
- Riverbend Unit infill oil and gas development
- SITLA active oil and gas and oil shale leases
- UDOGM gas well pads

RFFAs in the CIAA for Uinta Basin hookless cactus include:

- TransWest Express Transmission Project
- Monument Butte EIS oil and gas development
- Kerr-McGee oil and gas development

The incremental Project-related development in Level 2 *Sclerocactus* core habitat would account for only a minor portion (104 to 107 acres) of the total cumulative effects predicted in the CIAA for Alternatives COUT-C, COUT-H, and COUT-I (Table 4-65).

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, Level 2 *Sclerocactus* core habitat in the CIAA for Alternatives COUT-C, COUT- H and COUT-I has been affected by a small wildfire. As this fire affected a very minor portion of potential habitat and potential habitat has low vegetation cover, the effects should be minimal.

FWS has recommended that total ground disturbance in Level 2 *Sclerocactus* core habitat areas be maintained at or below 5 percent and that no additional ground disturbance occur if total (unreclaimed) disturbance exceeds this limit (FWS 1990). Disturbance from past and present actions accounts for approximately 14 percent (9,379 acres) of total surface area in Level 2 *Sclerocactus* core habitat areas and, therefore, actions of the Project and other RFFAs would not be consistent with FWS management recommendations in these areas. The effects of the Project and other RFFAs would contribute approximately 4 percent (385 to 388 acres) of the total estimated cumulative ground disturbance in Level 2 *Sclerocactus* core habitat areas, and ground disturbance resulting from the Project would range from 104 to 107 acres (approximately 30 percent) of the disturbance resulting from all RFFAs.

The methods used to evaluate ground disturbance in *Sclerocactus* core habitats may overestimate the amount of ground disturbance in the CIAA from the Project and other past and present actions and RFFAs. All actions in Level 2 *Sclerocactus* core habitat areas would be managed to minimize effects on individual cacti and their habitats. Micro-siting of Project features and other selective mitigation measures as described in Sections 3.2.6.4.3 and 3.2.6.5.4 and would minimize impacts in Level 2 *Sclerocactus* core areas.

White River Beardtongue

The loss, fragmentation, and modification of White River beardtongue habitat under Alternatives COUT-B and COUT-C, COUT-H, and COUT-I would contribute to the cumulative loss, fragmentation, and modification of White River beardtongue habitat. The extent of cumulative development on White River beardtongue habitat for all relevant alternative routes is summarized in Table 4-66.

TABLE 4-66
WHITE RIVER BEARDTONGUE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-B	38,005	2,017	707	89	2,813	35,191
COUT-C (Agency and Applicant Preferred Alternative)	89,531	4,415	550	128	5,093	84,437
COUT-H	89,266	4,385	530	111	5,026	84,240
COUT-I	89,266	4,385	530	110	5,024	84,242

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present activities in the CIAA that would affect White River beardtongue habitat include:

- SITLA active metalliferous mineral leases and mineral materials permits
- Berry Petroleum South Unit oil and gas development
- BLM Price, Vernal, and White River Field Office oil and gas units
- Gasco oil and gas units
- Lake Canyon EDA oil and gas units
- Rye Patch oil drilling project oil and gas development
- SITLA active oil and gas and oil shale leases
- West Tavaputs Plateau oil and gas development
- Red Leaf Oil Shale Project development
- residential development

The RFFAs in the CIAA that would affect White River beardtongue habitat is the TransWest Express Transmission Project.

In addition to the past, present and RFFAs analyzed quantitatively in this section, potential habitat for White River beardtongue in the CIAA for all COUT alternative routes has been affected by historic wildfires and vegetation management. Two large fires (Church Camp [2012] and Garder [2002]) affect small areas of potential habitat in the CIAA for Alternatives COUT-B, COUT-C, COUT-H, and COUT-I. BLM vegetation management activities affect even smaller areas in the CIAA for Alternatives COUT- B. Fire disturbance effects should be minimal due to the low vegetation cover within potential White River beardtongue habitat.

The incremental Project-related development in White River beardtongue habitat would account for only a minor portion (89 to 128 acres) of the total cumulative effects predicted in the CIAA for Alternatives COUT- B, COUT-C, COUT-H and COUT-I (Table 4-66).

4.3.7 Wildlife

The section addresses potential cumulative effects on wildlife resources resulting from the Project in addition to past and present actions and RFFAs. Resources addressed in this section are the same as those described in Section 3.2.7.

The approach for analysis of cumulative effects on wildlife resources, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative effects analysis for wildlife considers direct and indirect impacts from the Project (described in Section 3.2.7) in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2. Crucial and severe habitat data were used to assess cumulative effects on big game and were obtained from WGFD, CPW, and UDWR (Table 4-67). For wildlife species with limited data available for analysis that could occur in the Project area, a qualitative evaluation of the potential cumulative effects was performed. For information regarding species life histories that support the analysis of cumulative effects, refer to Section 3.2.7.4 and Appendix J.

The geographic scope for detailed analysis of cumulative effects on wildlife resources is identified by species in Table 4-67. CIAAs were established for wildlife species based on the best available information regarding species-specific home ranges or territory sizes.

4.3.7.1 Issues Identified for Analysis

4.3.7.1.1 Cumulative Impacts on Big Game Crucial and Severe Habitat

Potential impacts on big game populations and crucial and severe habitat were identified as a cumulative effects issue by the agencies and during public scoping. The quality and quantity of available winter range is the foremost limiting factor for big game populations identified by state wildlife agencies in Wyoming, Colorado (CDOW 2005, 2006a, 2006b), and Utah (UDWR 2007a, b; 2008a, b, c; 2010a). Habitat quality is necessary for maintaining long-term survival of big game species by providing adequate forage and cover. Availability of crucial and severe winter range is essential for population survival during extreme or persistent climatic conditions, and is used during seasonal shortages in forage (Byers 2003; Peek 2003). Development that occurs in limited habitats or winter ranges places pressure on local wildlife populations and impacts habitat quality and function (Sawyer et al. 2002). Surrounding habitat often cannot absorb or dissipate impacts from sensitive habitats (Watkins et al. 2007).

The cumulative effects analysis for big game species and their habitats addresses the potential effects of the Project, other past and present actions, and RFFAs and their contribution to loss, fragmentation, and modification of vegetation that provides crucial and severe elk, mule deer, pronghorn, moose, and bighorn sheep habitats and forage (i.e., the degree to which these actions could place pressure on local wildlife populations and have additive effects on big game limiting factors such as habitat quality and availability of crucial and severe habitat and the potential for these cumulative actions to affect local populations). Cumulative impacts on big game crucial and severe habitat were analyzed quantitatively, and effects are discussed qualitatively. Areas affected by wildfires were excluded from the quantitative analysis, as vegetation communities can recover from these events. Recovery from wildfires depends on the time since the occurrence, precipitation amounts, plant species, and degree of associated degradation (weed invasion, soil loss, and fire intensity). Vegetation management areas were also excluded for similar reasons; additionally, these areas were assumed to have beneficial effects.

TABLE 4-67
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR WILDLIFE

Habitat Types[1]	Cumulative Impacts Analysis Area[2]	Rationale	Type and Source of Spatial Data[3]
Big Game			
Elk Calving Ground Crucial Spring/Fall Crucial Summer/Summer Concentration Areas Crucial/Severe Winter Range Crucial Year-long Migration Corridors	Contiguous designated crucial and severe habitat in hunt units in Wyoming, game management units in Colorado, and herd units in Utah crossed by alternative routes	Areas essential for the survival of individual elk and local elk populations that may be affected by the Project	Seasonal range boundaries and migration corridors (WGFD 2008, 2011b), production areas, severe winter range, summer concentration areas, and migration corridors (CPW 2012c) , and seasonal range boundaries (UDWR 2007a)
Mule Deer Crucial Summer/Summer Concentration Areas Crucial Spring/Fall Crucial/Critical Winter Range Crucial Winter/Spring Crucial Year-long Migration Corridors	Contiguous designated crucial and critical habitat in hunt units in Wyoming, game management units in Colorado, and herd units in Utah crossed by alternative routes	Areas essential for the survival of individual mule deer and local mule deer populations that may be affected by the Project	Seasonal range and migration corridors (WGFD 2008, 2010a), critical winter range and migration corridors (CPW 2012d), seasonal range boundaries (UDWR 2007b)
Pronghorn Fawning Areas Crucial/Severe Winter Range Crucial Year-long Migration Corridors	Contiguous designated crucial and severe habitat in hunt units in Wyoming, game management units in Colorado, and herd units in Utah crossed by alternative routes	Areas essential for the survival of individual pronghorn and local pronghorn populations that may be affected by the Project	Seasonal range and migration corridors (WGFD 2008, 2010a), severe winter range, and migration corridors (CPW 2012e), summer and yearlong habitats (UDWR 2010a)
Moose Calving Ground Crucial Spring/Fall Crucial Winter Range Crucial Year-long	Contiguous designated crucial habitat in hunt units in Wyoming, and herd units in Utah crossed by alternative routes	Areas essential for the survival of individual moose and local moose populations that may be affected by the Project	Seasonal range boundaries (UDWR 2006b; WGFD 2011d)
Rocky Mountain Bighorn Sheep Crucial Year-long	Contiguous designated crucial habitat in hunt units in Wyoming, and herd units in Utah crossed by alternative routes	Areas essential for the survival of individual Rocky Mountain bighorn sheep and local Rocky Mountain bighorn sheep populations that may be affected by the Project	Seasonal range boundaries (UDWR 2006a; WGFD 2011a)

TABLE 4-67
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR WILDLIFE

Habitat Types[1]	Cumulative Impacts Analysis Area[2]	Rationale	Type and Source of Spatial Data[3]
Desert Bighorn Sheep Crucial Year-long	Contiguous designated habitat in wildlife management units crossed by alternative routes	Areas essential for the survival of individual desert bighorn sheep and local desert bighorn sheep populations that may be affected by the Project	Seasonal range boundaries (UDWR 2008b)
Reptiles			
Reptiles	Vegetation communities in 12-digit HUCs (subwatersheds) crossed by alternative routes	Area beyond which effects of the Project on reptiles are no longer discernible	GAP land cover categories from Northwest and Southwest Regional Gap Analysis Project (USGS 2010b, c)
Mammals			
Mammals	Vegetation communities in 12-digit HUCs (subwatersheds) crossed by alternative routes	Area beyond which effects of the Project on mammals are no longer discernible	GAP land cover categories from Northwest and Southwest Regional Gap Analysis Project (USGS 2010b, c)

NOTES:

[1] Agency-designated big game habitats vary by state. Summer concentration, critical winter and severe winter are designated big game habitats in Colorado. Crucial summer, winter, and year-long are designated habitats in Wyoming and Utah; crucial spring/fall and crucial winter/spring are designated habitat in Utah only. Mapped migration corridors are designated in Wyoming and Colorado only.

[2] Cumulative impacts analysis areas were established for wildlife designated and potential habitats based on the best available information regarding species-specific home range or territory size.

[3] When data were provided as line files, migration corridors for elk, mule deer, and pronghorn were buffered by 0.25 mile on either side. Migration corridor data for elk, mule deer, and pronghorn were unavailable for the state of Utah.

4.3.7.1.2 Synergistic Temporal Effects with Other Actions

The potential for temporal and/or spatial synergistic, adverse effects on wildlife resulting from the construction of the Project and other transmission line projects (i.e., the TransWest Express and Gateway West transmission projects) were identified by the agencies and public during scoping. This analysis assumes the selected route for the Project and the selected routes for the TransWest Express and the Gateway West (in Wyoming) transmission projects would be colocated in the same corridor. Construction of the Project may follow and potentially overlap construction and stabilization efforts of the TransWest Express Transmission Project. Overlapping construction and stabilization periods for the two projects could result in temporal effects that could prolong displacement of wildlife from important habitats, displacement of wildlife from a larger geographic area, and extend the potential recovery time of wildlife from the direct and indirect effects of the Project. In areas where multiple transmission projects would be collocated in the same corridor, the effects of wildlife displacement could be greater. The presence of multiple transmission lines could become a barrier to movement for some species or individuals or increase the intensity or extent of indirect effects. Cumulative effects of the Project and the TransWest Express and the Gateway West transmission projects are discussed qualitatively for each resource analyzed in detail.

4.3.7.1.3 Past, Present, and Other Reasonably Foreseeable Future Actions in the Wildlife Cumulative Impacts Analysis Area

Land administered by the Ashley, Manti-La Sal, and Uinta National Forests and the BLM in the Project area are managed for multiple-resource use. Past and present actions and RFFAs in the CIAA include timber harvest, livestock grazing, recreational use (e.g., off-road-vehicle use, biking, hiking, camping, and hunting), oil and gas exploration and development, mining, mineral production, transmission lines, pipelines, highways, wind- and solar-energy development, military training/testing, residential subdivision expansion, and communication site development. Past and present actions have contributed to incremental loss, alteration, and fragmentation of foraging, nesting, and breeding habitat and cover for wildlife species. Continuation of past and present actions into the future, in addition to other RFFAs, is anticipated to contribute to the incremental modification of wildlife habitats in the CIAA. For a comprehensive summary of past and present actions and RFFAs refer to Tables 4-1 and 4-2.

4.3.7.2 Existing Condition

Conversion of native vegetation to agricultural use, deforestation, and crop cultivation in the CIAA began in the middle of the nineteenth century with European settlement and expansion and has significantly affected the character of landscapes and the quantity and quality of habitats for wildlife resources in the CIAA (Huston 2005). Construction of settlements and transportation systems and increases in human population growth, the recreational industry (Leung and Marion 2000), and energy development also have resulted in further conversion of wildlife habitats and significant shifts in the abundance, distribution, and species composition of the fauna and flora of the area. These historic modifications to the landscape have resulted in baseline conditions and trends to which the Project, other past and present actions, and RFFAs (refer to Tables 4-1 and 4-2) analyzed in this section could contribute continuing and additive cumulative effects.

Energy and mineral development in the CIAA continue to place pressure on big game behavior and population dynamics through the loss, modification, and fragmentation of crucial habitat. Habitat quality and quantity remains a primary concern to wildlife managers (UDWR 2008c, 2009a, 2010b). Roads have increased the risk of ungulate mortality and potential disturbance and stress to big game from increased recreational activity, human presence, and noise; factors that can affect individual health, fitness and reproductive rates in big game (Bowles 1995; Leung and Marion 2000).Sensitivity to and/or toleration of anthropogenic disturbance in the CIAA, however, is likely to be species-specific and a function of population or individual response to disturbance.

Domestic livestock grazing in the CIAA has increased competition for forage between livestock and big game species, particularly in crucial winter ranges or summer ranges where habitat and forage is limited or affected by drought (UDWR 2008c, 2009a, 2010b). Livestock grazing also has altered native plant communities and increased exotic grass and invasive plant encroachment, which has had an additive effect on habitat loss and degradation in the CIAA. Furthermore, fences may alter movement patterns between seasonal ranges, restrict access to water and feeding areas, and disrupt migration patterns in the CIAA; particularly for pronghorn and mule deer (UDWR 2008c, 2009b).

Despite these incremental modifications of natural landscapes, however, wildlife habitat functionality is maintained and oftentimes enhanced on USFS- and BLM-administered lands and private lands in the Project area through habitat restoration and improvement projects that promote ecosystem health (BLM 2013at), management of invasive species (USFS 2004b), and government incentive programs such as the Wildlife Habitat Incentives Program (NRCS n.d.).

4.3.7.3 Results

4.3.7.3.1 Cumulative Impacts on Wildlife Resources Common to all Alternative Routes

The alternative routes cross similar ecosystems that support wildlife resources, and the types of past and present actions and RFFAs in the CIAA for all alternative routes are also similar. Due to the similarity of resources affected and past, present, and future actions in the CIAA, many cumulative effects on wildlife resources would be common to all alternative routes. Data that could be used to complete a quantitative analysis of the cumulative effects on the Project and other past and present actions and RFFAs are not available for most bird, reptile, and mammal species. Therefore, the potential effects on these resources are analyzed qualitatively.

Reptiles

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of reptile habitats resulting from past and present actions and RFFAs in the CIAA. Past and present actions in the CIAA include:

- coal mines
- communication facilities
- historical fire boundaries
- pipelines
- mineral leases
- oil and gas development
- oil shale development
- recreational and residential development
- wind-energy facilities
- Gateway West Transmission Project

RFFAs in the CIAA include:

- coal mines
- industrial development
- oil and gas development
- pipelines

- power generation facilities
- recreational and residential development
- habitat restoration projects
- TransWest Express, Mona South, and Mona North transmission projects

Population declines in many reptile species have been attributed to habitat loss and degradation, invasive species introduction, environmental pollutants (such as pesticides and herbicides), and physiological factors (Gibbons et al. 2000). Cumulative effects on reptiles and their habitat from actions in the CIAA would include the loss, alteration, and fragmentation to foraging and breeding habitat and cover, which would reduce habitat quality and function and could affect reptile abundance and distribution and mortality rates (Newbold 2005; Stebbins 2003; Vitt and Pianka 1994; Yahner et al. 2001). Reptile sensitivity to and recovery from cumulative disturbance in the CIAA is likely to be a function of species-specific characteristics and behavior and the type of action (scale, density and arrangement) of each development in relation to occupied habitat.

High-density developments (such as oil and gas fields), which clear vegetation, affect microclimate, and increase soil compaction, could have greater cumulative impacts on reptiles than low density development (such as dispersed recreation projects). Alternatively, gas-well disturbance may be used by reptiles seasonally for basking and egg-laying (Moseley et al. 2010). Impacts on reptiles from road construction that result in reptile avoidance or changes in movement may depend on road characteristics (such as width and road surface) and the degree of visual disturbance, noise, and vibration of activity on the road (Brehme et al. 2013).

The Project could overlap spatially with the TransWest Express and/or the Gateway West (in Wyoming) transmission projects and could result in cumulative effects on reptiles in the Project area. Additionally, construction and reclamation activities of the Project could temporally overlap with the construction and reclamation activities of the TransWest Express Transmission Project, which could result in synergistic effects that prolong disturbance on reptile species. Research suggests that revegetation efforts and early successional foliage could increase habitat for reptiles on rights-of-way and result in a greater abundance of reptile species than in the adjacent border zones (Yahner 2004; Yahner et al. 2001). However, reptile response to vegetation treatments likely would be a function of the quality, availability and type of surrounding habitat.

Overall, the Project would contribute to past and future modification of potentially suitable reptile habitat, and the cumulative disturbance from all actions considered could place additional stress on habitats that are currently limiting for reptile populations in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions as the majority of ground disturbance in the CIAA would result from other actions. Under all alternative routes, the majority of potentially suitable reptile habitat would remain undisturbed by the Project and other actions in the CIAA. Quantitative analysis of cumulative impacts on habitat types likely to be used by reptiles is included in Section 4.3.5.

Mammals

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of mammal habitats resulting from past and present actions and RFFAs in the CIAA (refer to the Section 3.2.7 for a detailed list of past and present actions and RFFAs in the CIAA for all alternative routes).

Recent small mammal surveys in the Intermountain West region suggest a lack of mammal occurrence in suitable shrub-steppe habitats (Dobkin and Sauder 2004). Of 22 species surveyed, only 1 species appeared to be relatively common. Small terrestrial mammals were found in small, disconnected populations, isolated by unsuitable habitat that restricted movement. Cumulative effects on mammals and potentially suitable habitat as a result of Project impacts and other past, present, and future actions include loss, alteration, and fragmentation to foraging and breeding habitat and cover, which could affect mammal abundance, distribution, dispersal, and survival (Hanser et al. 2011a; Noss et al. 2006a) in the CIAA. Mammal sensitivity to and recovery from cumulative disturbance in the CIAA is likely to be a function of species-specific characteristics and behavior and the type of action (scale, density and arrangement) of each development in relation to occupied habitat.

High-density developments (such as oil and gas fields) that affect microclimate and increase noise and soil compaction or developments that increase habitat fragmentation (such as roads) through vegetation clearance could have greater cumulative impacts on mammals than low-density or nonfragmenting development (such as dispersed recreation projects). Continuous and intermittent noise from anthropogenic development can have considerable effects on foraging and reproductive success, anti-predator and territorial behavior, and community structure in a diverse number of terrestrial species (Barber et al. 2009). Soil compaction associated with gas wells, for example, may suppress establishment of suitable vegetation cover, increase predation risk, and affect mammal abundance (Moseley et al. 2010). Impacts on small mammals from road construction can result in avoidance or changes in movement due to road characteristics such as road width and surface (Brehme et al. 2013). Dirt roads and secondary paved roads may be more permeable to some small mammalian species than wider paved roads (Brehme et al. 2013). Mammals isolated in small patches of fragmented habitat are at increased risk of local extinction because recolonization, movement, and gene flow necessary for long-term persistence are restricted (Moseley et al. 2010).

Overall, the Project would contribute to past and future modification of potentially suitable habitat for mammals, and the cumulative disturbance from all actions considered could contribute to factors currently limiting mammal populations in the CIAA. The Project could overlap spatially with the TransWest Express and/or the Gateway West (in Wyoming) transmission projects and could result in cumulative effects on mammals in the Project area. Additionally, construction and reclamation activities of the Project could temporally overlap with the construction and reclamation activities of the TransWest Express Transmission Project, resulting in cumulative effects that prolong disturbance on mammal species. However, the effects of the Project would be anticipated to be small compared to the effects of other actions. Under all alternative routes, the majority of potentially suitable mammal habitat would remain undisturbed by the Project and other actions in the CIAA. Quantitative analysis of cumulative impacts on habitat types likely to be used by mammals is included in Section 4.3.5.

4.3.7.3.2 Quantitative Cumulative Impacts on Wildlife Resources

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Elk

The estimated area (in acres) of cumulative development in elk habitats is summarized in Table 4-68.

TABLE 4-68
ELK HABITAT CUMULATIVE EFFECTS SUMMARY
FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO)
ALTERNATIVE ROUTES IN ACRES

		No Action Alternative				
Alternative Routes	**Total Available Resource**	**Past and Present Development**	**Reasonably Foreseeable Future Actions**	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**
Calving Grounds						
WYCO-B (Agency and Applicant Preferred Alternative)	263,456	6,226	313	162	6,701	256,755
WYCO-C	263,456	6,226	313	162	6,701	256,755
WYCO-D	310,104	12,239	8,227	0	20,466	289,638
WYCO-F	263,456	6,226	313	161	6,701	256,755
Crucial Summer/Summer Concentration						
WYCO-B (Agency and Applicant Preferred Alternative)	272,236	3,952	346	162	4,460	267,776
WYCO-C	272,236	3,952	346	162	4,460	267,776
WYCO-D	355,187	18,540	5,142	0	23,683	331,504
WYCO-F	272,236	3,952	346	161	4,459	267,776
Crucial/Severe Winter Range						
WYCO-B (Agency and Applicant Preferred Alternative)	461,718	21,919	1,722	416	24,057	437,662
WYCO-C	461,718	21,919	1,722	415	24,056	437,662
WYCO-D	1,080286	104,788	3,620	1,196	109,604	970,681
WYCO-F	461,718	21,919	1,722	413	24,054	437,664
Crucial Year-long						
WYCO-B (Agency and Applicant Preferred Alternative)	299,860	11,933	149	45	12,128	287,733
WYCO-C	299,860	11,933	149	45	12,127	287,733
WYCO-D	382,896	12,679	149	0	12,828	370,069
WYCO-F	299,860	11,933	149	45	12,127	287,733
Migration Corridors						
WYCO-B (Agency and Applicant Preferred Alternative)	362,077	8,009	133	43	8,185	353,892
WYCO-C	362,077	8,009	133	43	8,185	353,892
WYCO-D	622,129	34,218	2,378	341	36,937	585,192
WYCO-F	362,077	8,009	133	43	8,185	353,892
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated elk habitats from any of the WYCO alternative routes would contribute to the cumulative loss, fragmentation, and degradation of elk habitats in the CIAA (Table 4-68).

Past and present actions in the CIAA for all WYCO alternative routes that have affected designated elk crucial habitat include:

- oil and gas development
- coal mines
- wind-energy development

RFFAs in the CIAA for elk calving grounds, crucial/severe winter and crucial year-long habitat include:

- coal mine
- TransWest Express Transmission Project

The Gateway West Transmission Project is a past or present action in the CIAA for elk migration routes. A wind-energy facility is an RFFA in elk migration routes.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, elk crucial habitat affected by wildfires and vegetation management occurs in the CIAA for all WYCO alternative routes. Several fires in Colorado, including Winter Valley (2000), Lone Tree (2007), Mud Springs (2007), and Bitter Brush (2006), and several BLM vegetation management activities in Wyoming have affected areas of elk crucial habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in elk crucial habitat, but the quality of elk crucial habitat affected by fire is anticipated to improve in the long-term as a result of increased forage availability.

The majority of elk crucial/severe range affected by the Project is located in Colorado. Elk herds affected by the Project in Colorado include the E-2 (Bears Ears) and E-6 (White River) herds, which are currently over carrying capacity due to increased population numbers and ongoing loss, fragmentation, and alteration of crucial habitat (CDOW 2005). The availability of crucial winter range in the CIAA is a limiting factor for elk populations, and would be affected more by Alternative WYCO-D compared to other WYCO alternative routes. Elk crucial/severe range and migration corridors affected by the WYCO alternative routes are located in areas previously disturbed by past and present human activities, suggesting local elk populations have some level of tolerance towards human activity and habitat disturbance.

Research suggests some elk compensate for site-specific environmental disturbance from energy development such as oil and gas development by shifting range use, centers of activity, and habitat use rather than abandoning the range completely (Van Dyke and Klein 1996). Further research showed that elk use of sites cleared for oil and gas development was not immediate but correlated with an increase in grass and forb abundance over a 2 year period after construction (Van Dyke et al. 2012). Elk also were found to shift range use during construction of a wind-energy facility when human presence increased but subsequently acclimated to the development and crossed access roads in their range; elk range shifts did not affect their nutrition and dietary quality despite loss of resources due to development (Walter et al. 2006).

The WYCO alternative routes could overlap spatially with the TransWest Express and the Gateway West (in Wyoming) transmission projects. Additionally, disturbance from construction and reclamation activities of the Project could temporally overlap with the construction and reclamation activities of the TransWest Express Transmission Project, which could result in synergistic temporal effects that could prolong elk avoidance of crucial habitat in proximity to the two transmission lines. Impacts on elk populations would be minimized or avoided through implementation of seasonal restrictions for both projects. Overall, the Project would contribute to past and future modification of elk habitats, and the cumulative disturbance from all actions considered could add to carrying capacity pressure of local herds by limiting the availability of habitat in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-68). Under all WYCO alternative routes, the majority of available elk habitats would remain undisturbed by the Project and other actions in the CIAA (Table 4-68).

Mule Deer

The estimated area (in acres) of cumulative development in mule deer habitats is summarized in Table 4-69.

TABLE 4-69
MULE DEER HABITAT CUMULATIVE EFFECTS SUMMARY
FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO)
ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial/Critical Winter Range						
WYCO-B (Agency and Applicant Preferred Alternative)	585,578	37,071	2,217	380	39,668	545,909
WYCO-C	585,578	37,071	2,217	380	39,668	545,910
WYCO-D	877,772	76,577	3,036	719	80,331	797,441
WYCO-F	585,578	37,071	2,217	378	39,666	545,911
Crucial Year-long						
WYCO-B (Agency and Applicant Preferred Alternative)	622,086	54,058	2,281	353	56,691	565,394
WYCO-C	622,086	54,058	2,281	322	56,660	565,425
WYCO-D	898,837	73,073	2,281	602	75,956	822,881
WYCO-F	622,086	54,058	2,281	496	56,834	565,251
Migration Corridors						
WYCO-B (Agency and Applicant Preferred Alternative)	220,746	15,359	1,566	62	16,987	203,759
WYCO-C	220,746	15,359	1,566	60	16,985	203,761
WYCO-D	248,169	18,470	1,573	157	20,200	227,969
WYCO-F	220,746	15,359	1,566	211	17,136	203,610
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated mule deer habitats from any of the WYCO alternative routes would contribute to the cumulative loss, fragmentation, and degradation of mule deer habitats in the CIAA (Table 4-69).

Past and present actions in the CIAA for all WYCO alternative routes that have affected designated mule deer habitats include:

- oil and gas development
- coal mines
- industrial development
- wind-energy development
- Gateway West Transmission Project

RFFAs in the CIAA for all WYCO alternative routes include:

- oil and gas development
- coal mines
- wind-energy development
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, mule deer habitat affected by wildfires and vegetation management occurs in the CIAA for all WYCO alternative routes. Several fires in Colorado, including Lone Tree (2007), Mud Springs (2007), and Bitter Brush (2006), and several BLM vegetation management activities in Wyoming have affected areas of mule deer habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in mule deer habitat, but the quality of mule deer habitat is anticipated to improve in the long-term as a result of increased forage availability.

Potential impacts on mule deer populations in the CIAA from past and present actions and RFFAs could be a function of the type of action and scale, density, and arrangement of each development in designated habitat (Lutz et al. 2011). Large-scale or high-density actions that disrupt mule deer over multiple breeding seasons (e.g., high density oil and gas development and infrastructure) would have greater impacts than low-density development. Similarly, actions such as habitat and vegetation management could have beneficial effects on mule deer.

In Wyoming, mule deer herds affected by the Project include the Platte River (MD541) and Baggs (MD247) herds (WGFD 2011c). Ongoing loss, fragmentation, and alteration of habitat from energy development and the availability of critical/severe winter range and production areas are limiting factors for mule deer in the CIAA. Mule deer critical/severe winter range affected by any of the WYCO alternative routes is located in areas previously disturbed by past and present human activities, suggesting local mule deer populations tolerate some level of human activity and habitat disturbance. The Project could overlap spatially with the TransWest Express and/or the Gateway West (in Wyoming) transmission projects and could result in synergistic effects on mule deer in the Project area. Additionally, synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong mule deer displacement from critical/severe habitat and increase physiological stress in populations in proximity to the colocated Projects, although impacts on mule deer would be subject to seasonal selective mitigation measures.

Overall, the Project would contribute to past and future modifications of mule deer habitat, and the cumulative disturbance from all actions considered could contribute to ongoing loss, fragmentation, and alteration of habitat that limit local mule deer populations in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-69). Under all WYCO alternative routes, the majority of available mule deer habitat in Wyoming and Colorado would remain undisturbed by the Project and other actions in the CIAA (Table 4-69).

Pronghorn

The estimated area (in acres) of cumulative development in pronghorn habitat is summarized in Table 4-70.

TABLE 4-70
PRONGHORN HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial/Severe Winter Range						
WYCO-B (Agency and Applicant Preferred Alternative)	228,024	14,315	924	252	15,491	212,533
WYCO-C	228,024	14,315	924	251	15,490	212,533
WYCO-D	258,271	22,763	1,421	591	24,776	233,496
WYCO-F	228,024	14,315	924	250	15,489	212,534
Crucial Year-long						
WYCO-B (Agency and Applicant Preferred Alternative)	785,791	46,166	7,091	461	53,717	732,074
WYCO-C	785,791	46,166	7,091	418	53,674	732,117
WYCO-D	1,109,063	80,802	7,091	539	88,432	1,020,630
WYCO-F	785,791	46,166	7,091	523	53,780	732,011
Migration Corridors						
WYCO-B (Agency and Applicant Preferred Alternative)	192,733	8,542	1,950	141	10,633	182,099
WYCO-C	192,733	8,542	1,950	115	10,607	182,126
WYCO-D	225,064	11,075	1,948	86	13,109	211,955
WYCO-F	192,733	8,542	1,950	166	10,658	182,075
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated pronghorn habitats from any of the WYCO alternative routes would contribute to the cumulative loss, fragmentation, and degradation of pronghorn habitats in the CIAA (Table 4-70).).

Past and present actions in the CIAA for all WYCO alternative routes that have affected designated pronghorn habitat include:

- oil and gas development
- coal mines
- residential development
- wind-energy development
- Gateway West Transmission Project

RFFAs in the CIAA for all WYCO alternative routes include:

- oil and gas development
- coal mines
- wind-energy development
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, pronghorn habitat affected by wildfires and vegetation management occurs in the CIAA for all WYCO alternative routes. Several fires in Colorado, including Lone Tree (2007), Mud Springs (2007), and Bitter Brush (2006), and several BLM vegetation management activities in Wyoming have affected areas of pronghorn habitat. Wildfires and vegetation management may result in initial temporary losses in pronghorn habitat, but the quality of pronghorn crucial habitat is anticipated to improve in the long-term as a result of increased forage availability.

Potential impacts on pronghorn populations in the CIAA from past and present actions and RFFAs could be a function of the location and type of development in relation to the location of pronghorn designated habitat. Development that severs migration corridors, particularly via roads or fences, could affect distribution of pronghorn on winter ranges (Sawyer et al. 2002). Large-scale or high density actions that disrupt pronghorn over multiple breeding seasons (e.g., high density oil and gas development and infrastructure) would have greater impacts than low-density development.

In Wyoming, pronghorn herds that could be affected by the WYCO alternative routes include Iron Springs herd (PR630) with a population estimated at approximately 10,000; Baggs herd (PR438) with an estimated population of 8,100; and Bitter Creek herd (PR414) with an average population of 7,531 (WGFD 2011b). Ongoing loss, fragmentation, and alteration of habitat from energy development and the availability of crucial/severe winter range and fawning areas are limiting factors for pronghorn in the CIAA. Pronghorn crucial/severe range affected by any of the WYCO alternative routes is located in areas previously disturbed by past and present human activities, suggesting local pronghorn populations tolerate some level of human activity and habitat disturbance. However, individual response of pronghorn to energy development can vary from tolerance to strong avoidance (Berger et al. 2007).

Disturbance from construction and stabilization of any of the WYCO alternative routes could overlap temporally with the construction and stabilization activities of the TransWest Express and/or the Gateway West (in Wyoming) transmission line projects and could result in synergistic temporal effects that prolong pronghorn displacement from habitat in proximity to the colocated transmission lines. Impacts on pronghorn from both transmission line projects would be minimized or avoided through implementation of seasonal restrictions. Overall, the Project would contribute to past and future modification of pronghorn habitat, and the cumulative disturbance from all actions considered could contribute to ongoing loss, fragmentation, and alteration of habitat and the availability of habitat that limit local pronghorn herds in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-70). Under all WYCO alternative routes, the majority of available pronghorn habitat in Wyoming and Colorado would remain undisturbed by the Project and other actions in the CIAA (Table 4-70).

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Elk

The estimated area (in acres) of cumulative development in elk habitats is summarized in Table 4-71.

TABLE 4-71
ELK HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
COUT BAX-B	275,394	7,547	249	72	7,869	267,525
COUT BAX-C	275,394	7,547	249	72	7,869	267,525
COUT BAX-E	275,394	7,547	249	71	7,868	267,526
Crucial Summer/Summer Concentration						
COUT BAX-B	849,861	69,072	918	357	70,346	779,514
COUT BAX-C	1,010,484	85,329	1,086	355	86,770	923,714
COUT BAX-E	1,101,484	85,329	1,086	241	86,656	923,828
Crucial/Severe Winter Range						
COUT BAX-B	894,696	63,252	4,009	581	67,842	826,855
COUT BAX-C	1,041,050	66,726	4,408	577	71,711	969,339
COUT BAX-E	1,041,050	66,726	4,408	793	71,927	969,123

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

The loss, fragmentation, and modification of designated elk habitats from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of elk habitats in the CIAA (Table 4-71).

Past and present actions in the CIAA for all COUT BAX alternative routes that have affected designated elk habitat include:

- oil and gas development
- oil shale and tar sands development
- gravel pits
- oil shale development
- pipelines
- coal mines
- mineral development
- residential development
- communication facilities

RFFAs in the CIAA include:

- coal mines
- recreational development
- tunnel
- transportation infrastructure
- sand and gravel mining
- reservoir
- dam
- Pipelines
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, elk habitat affected by wildfires and vegetation management occurs in the CIAA for all COUT BAX alternative routes. Several large fires in Utah, including Seeley (2012), Wood Hollow (2012), and Salt Creek (2007), in addition to smaller fires in Utah and Colorado and a timber sale on the Manti-La Sal National Forest have affected areas of elk habitat. Wildfires and vegetation management may result in initial temporary losses in elk habitat, but the quality of elk habitat is anticipated to improve in the long-term as a result of increased forage availability.

Elk herds that could be affected by the COUT BAX alternative routes include the Yellow Creek (DAU E-10) herd in Colorado (CDOW 2006a) and the Central Mountains elk herd in Utah (UDWR 2012a). Limiting factors for elk in the CIAA include the availability of crucial winter range and an exponential increase in oil and gas development (CDOW 2006a). However, elk crucial/severe range affected by the COUT BAX alternative routes are located in areas previously disturbed by past and present human activities, suggesting local elk populations have some level of tolerance towards human activity and habitat disturbance. Furthermore, the E-10 herd has an increasing population of approximately 8,700 animals (CDOW 2006a), and the Central Mountains elk herd consists of approximately 12,600 animals, which is higher than management objectives (UDWR 2012a).

Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express transmission lines could prolong elk displacement from habitat in proximity to the two projects, although impacts on elk would be subject to seasonal selective mitigation measures (refer to elk discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of elk habitat, and the cumulative disturbance from all actions considered could further limit availability of habitat in the CIAA necessary for maintaining local elk herd populations currently close to or exceeding the carrying capacity of current resources (CDOW 2006a; UDWR 2012a). However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-71). Under all COUT BAX alternative routes, the majority of available elk habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-71).

Mule Deer

The estimated area (in acres) of cumulative development in mule deer habitats is summarized in Table 4-72.

TABLE 4-72
MULE DEER HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial Spring/Fall Range						
COUT BAX-B	0	0	0	0	0	0
COUT BAX-C	0	0	0	0	0	0
COUT BAX-E	0	0	0	0	0	0
Crucial Summer/Summer Concentration						
COUT BAX-B	881,930	75,335	948	136	76,419	805,510
COUT BAX-C	1,090,463	97,400	2,121	136	99,656	990,807
COUT BAX-E	1,090,463	97,400	2,121	36	99,557	990,906

TABLE 4-72
MULE DEER HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial/Critical Winter Range						
COUT BAX-B	2,030,119	114,593	6,052	1,013	121,659	1,908,460
COUT BAX-C	2,232,236	126,149	6,215	1,007	133,371	2,098,865
COUT BAX-E	2,232,236	126,149	6,215	1,040	133,404	2,098,832
Crucial Winter/Spring Range						
COUT BAX-B	535,735	23,861	2,577	41	26,479	509,256
COUT BAX-C	535,735	23,861	2,577	41	26,479	509,256
COUT BAX-E	535,735	23,861	2,577	73	26,511	509,224
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated mule deer habitats from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of mule deer habitats in the CIAA (Table 4-69).

Past and present actions in the CIAA for all COUT BAX alternative routes that have affected designated mule deer habitat include:

- oil and gas development
- oil shale and tar sands development
- coal mines
- gypsum mines
- pipelines
- sand and gravel pits
- mineral leases
- residential and recreational development
- communication facilities
- Gateway West Transmission Project

RFFAs in the CIAA for all COUT BAX alternative routes include:

- oil and gas development
- coal mines
- gypsum mines
- sand and gravel mining
- reservoir
- dam
- tunnel
- pipelines
- power generation facilities
- wind-energy development
- TransWest Express, Mona North, and Mona South transmission projects

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, mule deer habitat affected by wildfires and vegetation management occurs in the CIAA for all COUT BAX alternative routes. Several large fires in Utah, including Seeley (2012), Wood Hollow (2012), and Salt Creek (2007), in addition to smaller fires in Utah and Colorado and a timber sale on the Manti-La Sal National Forest have affected areas of mule deer habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in mule deer crucial habitat, but the quality of mule deer habitat is anticipated to improve in the long-term as a result of increased forage availability.

Potential impacts on mule deer populations in the CIAA from past and present actions and RFFAs could be a function of the type of action, and the scale, density, and arrangement of each development in designated habitat (Lutz et al. 2011).

Mule deer herds affected by the Project include the Book Cliffs (D-11) herd in Colorado, and the Central Mountains herd in Utah. The Book Cliffs herd has been in steady decline since 1990 and currently has a population of 8,600 animals (CDOW 2006b). The Central Mountains herd has a current population size of approximately 60,000 animals and is currently within management objectives (UDWR 2012c). Ongoing loss, fragmentation, and alteration of sensitive habitat; increases in energy development and human activity; and the availability of critical/severe winter range are limiting factors for mule deer herds in the CIAA. Mule deer critical/severe winter range has been affected by a wider variety of past and present actions than any other designated mule deer critical/severe range in the CIAA and is located in areas previously disturbed by past and present human activities, suggesting local mule deer populations tolerate some level of human activity and habitat disturbance.

Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong mule deer displacement from habitat, and physiological stress in populations in proximity to the two projects, although impacts on mule deer would be subject to seasonal selective mitigation measures (refer to mule deer discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of mule deer habitat, and the cumulative disturbance from all actions considered could contribute to ongoing loss, fragmentation, and alteration of habitat in the CIAA necessary for maintaining local mule deer herds. This includes the Book Cliffs herd in Colorado that already has a population decline due to habitat alteration and developmental pressure and the Central Mountains herd in Utah that is at carrying capacity due to the poor condition of winter range on the management unit (CDOW 2006b; UDWR 2006c). However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-72). Under all COUT BAX alternative routes, the majority of available mule deer habitat in Colorado and Utah would remain undisturbed by the Project and other actions in the CIAA (Table 4-72).

Pronghorn

The estimated area (in acres) of cumulative development in pronghorn habitats is summarized in Table 4-73.

TABLE 4-73
PRONGHORN HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Fawning Areas						
COUT BAX-B	534,266	16,936	4,728	940	22,603	511,663
COUT BAX-C	602,519	19,208	4,792	843	24,843	577,676
COUT BAX-E	602,519	19,208	4,792	1,084	25,084	577,435
Crucial/Severe Winter Range						
COUT BAX-B	58,471	3,690	117	39	3,845	54,626
COUT BAX-C	58,471	3,690	117	38	3,845	54,626
COUT BAX-E	58,471	3,690	117	38	3,845	54,626
Crucial Year-long						
COUT BAX-B	1,093,553	24,677	4,933	940	30,549	1,063,004
COUT BAX-C	1,161,819	26,953	4,998	843	32,794	1,129,025
COUT BAX-E	1,161,819	26,953	4,998	1,124	33,075	1,128,745

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

The loss, fragmentation, and modification of designated pronghorn habitats from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of pronghorn habitats in the CIAA (Table 4-73).

Past and present actions in the CIAA for all COUT BAX alternative routes that have affected designated pronghorn habitat include:

- oil and gas development
- coal mines
- residential development
- wind-energy development
- Gateway West Transmission Project

RFFAs in the CIAA for all COUT BAX alternative routes include:

- oil and gas development
- coal mines
- wind-energy development
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, pronghorn habitat affected by wildfires occurs in the CIAA for all COUT BAX alternative routes. Several small fires in Utah, including MM-218 (2007) and Bryson Wash (2006), have affected areas of pronghorn habitat in the CIAA. Wildfires may result in initial temporary losses in pronghorn habitat, but the quality of pronghorn habitat is anticipated to improve in the long-term as a result of increased forage availability.

Potential impacts on pronghorn populations in the CIAA from past and present actions and RFFAs could be a function of the location and type of development in relation to the location of pronghorn designated habitat. Development that include fences or roads can restrict movement between seasonal ranges and watering and feeding areas (Sawyer et al. 2002) and could have greater impacts on pronghorn population viability in the CIAA than development that does not restrict their movement.

Ongoing loss, fragmentation, and alteration of habitat from energy development, the availability of crucial/severe winter range, and the quality of spring/summer ranges are limiting factors for pronghorn in the CIAA (UDWR 2009b). Pronghorn crucial/severe range affected by any of the COUT BAX alternative routes is located in areas previously disturbed by past and present human activities, suggesting local pronghorn populations tolerate some level of human activity and habitat disturbance. However, individual response of pronghorn to energy development can vary from tolerance to strong avoidance (Berger et al. 2007).

Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong pronghorn displacement from habitat in proximity to the two projects, although impacts on pronghorn would be subject to seasonal selective mitigation measures (refer to pronghorn discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of pronghorn habitat, and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of resources limiting local pronghorn herds in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-73). Under all COUT BAX alternative routes, the majority of available pronghorn habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-73).

Moose

The estimated area (in acres) of cumulative development in moose habitats is summarized in Table 4-74.

TABLE 4-74
MOOSE HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE
COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX)
ALTERNATIVE ROUTES IN ACRES

		No Action Alternative				
Alternative Route	**Total Available Resource**	**Past and Present Development**	**Reasonably Foreseeable Future Actions**	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**
Calving Grounds						
COUT BAX-B	111,449	6,999	325	8	7,332	104,117
COUT BAX-C	111,449	6,999	325	8	7,332	104,117
COUT BAX-E	111,449	6,999	325	5	7,329	104,120
Crucial Winter Range						
COUT BAX-B	768,086	96,470	1,001	151	97,622	670,464
COUT BAX-C	900,003	116,021	2,646	150	118,818	781,185
COUT BAX-E	900,003	116,021	2,646	32	118,699	781,304
Crucial Year-long						
COUT BAX-B	111,449	6,999	325	8	7,332	104,117
COUT BAX-C	111,449	6,999	325	8	7,332	104,117
COUT BAX-E	111,449	6,999	325	5	7,329	104,120
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated moose habitats from any of the COUT BAX alternative routes would contribute to the cumulative loss, fragmentation, and degradation of moose habitats in the CIAA (Table 4-74).

Past and present actions in the CIAA for all COUT BAX alternative routes that have affected designated moose habitat include:

- oil and gas development
- coal mines
- sand and gravel mining
- residential development

RFFAs in the CIAA for all COUT BAX alternative routes include:

- coal mines
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, moose habitat affected by wildfires and vegetation management occurs in the CIAA for all COUT BAX alternative routes. The Seeley (2012) fire in Utah and a timber sale on the Manti-La Sal National Forest have affected areas of moose habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in moose habitat, but the quality of moose habitat is anticipated to improve in the long-term as a result of increased forage availability.

The moose population in Utah is currently estimated at 3,200 animals, and populations have intentionally been reduced, particularly in northern Utah, since 2005 as they have reached or exceeded carrying capacity of available habitat (UDWR 2009a). Habitat degradation and the availability of quality crucial habitat are limiting factors for moose populations in the CIAA for all COUT BAX alternative routes. Moose crucial habitat affected by any of the COUT BAX alternative routes is located in areas previously disturbed by past and present human activities, suggesting local moose populations tolerate human activity and habitat disturbance to some extent (UDWR 2009a).

Disturbance from construction and stabilization of any of the COUT BAX alternative routes could overlap temporally with the construction and stabilization activities of the TransWest Express Transmission Project and could result in synergistic temporal effects that prolong moose avoidance from crucial habitat in proximity to the two transmission lines. Impacts on moose from both transmission line projects would be minimized or avoided through implementation of seasonal restrictions. Overall, the Project would contribute to past and future modification of moose crucial habitat, and the cumulative disturbance from all actions considered could contribute to loss, modification, and fragmentation of crucial habitat, limiting moose populations that may already be exceeding carrying capacity of local resources in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-74). Under all COUT BAX alternative routes, the majority of available moose crucial habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-74).

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Elk

The estimated area (in acres) of cumulative development in elk habitats is summarized in Table 4-75.

TABLE 4-75
ELK HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
COUT-A	1,071,079	14,855	1,246	84	16,184	1,054,895
COUT-B	1,128,397	20,721	1,786	38	22,546	1,105,851
COUT-C (Agency and Applicant Preferred Alternative)	483,736	43,878	1,890	109	45,878	437,858
COUT-H	481,265	43,723	1,150	65	44,938	436,326
COUT-I	414,526	38,863	734	64	39,661	374,865
Crucial Spring/Fall Range						
COUT-A	463,284	7,032	5,109	281	12,421	450,863
COUT-B	463,284	7,032	5,109	38	12,179	451,105
COUT-C (Agency and Applicant Preferred Alternative)	460,397	6,873	5,065	41	11,979	448,418
COUT-H	274,779	4,917	162	0	5,079	269,700
COUT-I	147,774	3,508	65	0	3,572	144,202
Crucial Summer/Summer Concentration						
COUT-A	1,696,168	74,568	2,195	116	76,879	1,619,289
COUT-B	1,916,696	93,913	2,639	93	96,646	1,820,050
COUT-C (Agency and Applicant Preferred Alternative)	1,272,035	117,070	2,744	0	119,814	1,152,221
COUT-H	1,215,059	115,388	2,010	78	117,475	1,097,584
COUT-I	1,087,291	111,077	1,276	254	112,607	974,684
Crucial/Severe Winter Range						
COUT-A	1,504,761	118,764	5,692	988	125,444	1,379,318
COUT-B	1,742,057	126,198	6,403	813	133,413	1,608,643
COUT-C (Agency and Applicant Preferred Alternative)	1,706,074	114,666	6,381	1,139	122,186	1,583,887
COUT-H	1,647,606	112,491	5,961	391	118,843	1,528,762
COUT-I	1,332,277	91,728	4,401	580	96,709	1,235,568
Crucial Year-long						
COUT-A	136,718	8,366	1,536	44	9,946	126,772
COUT-B	250,328	17,672	2,077	41	19,789	230,539
COUT-C (Agency and Applicant Preferred Alternative)	257,112	18,009	2,077	136	20,212	236,890
COUT-H	251,442	17,784	1,336	65	19,186	232,256
COUT-I	183,399	12,884	897	132	13,913	169,487

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

The loss, fragmentation, and modification of designated elk habitats from any of the COUT alternative routes would contribute to the cumulative loss, fragmentation, and degradation of elk habitats in the

CIAA (Table 4-75). Elk crucial spring/fall habitat would not be affected by Alternatives COUT-H and COUT-I.

Past and present actions in the CIAA for all COUT alternative routes that have affected designated elk habitat include:

- oil and gas development
- oil shale and tar sands development
- sand and gravel pits
- pipelines
- coal mines
- mineral development
- residential development
- communication facilities

RFFAs in the CIAA include:

- coal mines
- oil and gas development
- tunnel
- transportation infrastructure
- dam
- Pipelines
- residential development
- development of recreation sites
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, elk habitat affected by wildfires and vegetation management occurs in the CIAA for all COUT alternative routes. Several large fires in Utah, including Seeley (2012), Wood Hollow (2012), and Salt Creek (2007), in addition to smaller fires in Utah and Colorado, and the Sheep Creek Vegetation Management Project on the Uinta-Wasatch-Cache National Forest have affected areas of elk habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in elk habitat, but the quality of elk crucial habitat is anticipated to improve in the long-term as a result of increased forage availability.

In Utah, elk that could be affected by the COUT alternative routes include the Wasatch Mountains elk herd, which had an estimated population of 6,478 animals in 2011, and is currently over the management objective of 5,400 animals (UDWR 2012a). Limiting factors to local elk herds in the CIAA include range conditions, energy development and urban expansion, and alteration and fragmentation of sensitive habitat (UDWR 2012a). Elk crucial/severe range would be affected by any of the COUT alternative routes, but is located in areas previously disturbed by past and present human activities, suggesting local elk populations have some level of tolerance towards human activity and habitat disturbance.

Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong elk displacement from habitat in proximity to the two projects; although impacts on elk would be subject to seasonal selective mitigation measures (refer to elk discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of elk habitat and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of habitats that limit local elk herds, including the Wasatch Mountains elk herd that is currently above management objectives due to resource pressure in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-75). Under all COUT alternative routes, the majority of available elk habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-75).

Mule Deer

The estimated area (in acres) of cumulative development in mule deer habitats is summarized in Table 4-76.

TABLE 4-76
MULE DEER HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Crucial Spring/Fall Range						
COUT-A	187,874	2,981	5,357	221	8,558	179,315
COUT-B	187,874	2,981	5,357	0	8,337	179,537
COUT-C (Agency and Applicant Preferred Alternative)	187,874	2,981	5,357	0	8,337	179,537
COUT-H	4,977	41	6	0	47	4,930
COUT-I	0	0	0	0	0	0
Crucial Summer/Summer Concentration						
COUT-A	2,254,072	92,881	7,704	317	100,902	2,153,170
COUT-B	2,495,212	116,600	8,938	41	125,579	2,369,633
COUT-C (Agency and Applicant Preferred Alternative)	1,770,129	122,821	8,867	539	132,227	1,637,903
COUT-H	1,489,152	119,335	4,513	40	123,887	1,365,265
COUT-I	1,072,742	106,616	2,183	215	109,014	963,727
Crucial/Critical Winter Range						
COUT-A	1,824,165	142,637	6,720	1,042	150,400	1,673,766
COUT-B	2,067,765	156,425	7,026	844	164,295	1,903,470
COUT-C (Agency and Applicant Preferred Alternative)	2,003,345	164,888	7,026	851	172,765	1,830,579
COUT-H	1,967,178	162,651	6,736	726	170,113	1,797,065
COUT-I	1,718,109	135,408	5,643	955	142,006	1,576,103
Crucial Winter/Spring Range						
COUT-A	608,008	25,551	4,751	463	30,765	577,243
COUT-B	608,008	25,551	4,751	376	30,678	577,330
COUT-C (Agency and Applicant Preferred Alternative)	608,008	25,551	4,751	796	30,698	577,310
COUT-H	537,287	24,085	2,605	80	26,770	510,517
COUT-I	535,735	23,861	2,577	43	26,482	509,254

TABLE 4-76
MULE DEER HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	**Reasonably Foreseeable Future Actions**			
Crucial Year-long						
COUT-A	262,529	94,035	387	40	94,462	168,067
COUT-B	310,384	102,662	568	29	103,259	207,125
COUT-C (Agency and Applicant Preferred Alternative)	163,180	34,207	272			
COUT-H	163,180	34,207	272	47	34,525	128,655
COUT-I	189,929	26,020	4,051	46	30,117	159,812
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated mule deer habitats from any of the COUT alternative routes would contribute to the cumulative loss, fragmentation, and degradation of mule deer habitats in the CIAA (Table 4-76).

Past and present actions in the CIAA for all COUT alternative routes that have affected designated mule deer habitat include:

- oil and gas development
- oil shale and tar sands development
- coal mines
- gypsum mines
- pipelines
- sand and gravel pits
- mineral leasing activities
- residential development
- educational and communication facilities

RFFAs in the CIAA for all COUT alternative routes include:

- oil and gas development
- coal mining
- gypsum mining
- sand and gravel mining
- reservoir
- transportation infrastructure
- helicopter port
- tunnel
- pipelines
- power generation facilities, including wind-energy development
- TransWest Express, Mona North, and Mona South transmission projects

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, mule deer habitat affected by wildfires and vegetation management occurs in the CIAA for all COUT alternative routes. Several large fires in Utah, including Seeley (2012), Wood Hollow (2012), and Salt Creek (2007), in addition to smaller fires in Utah and Colorado on the Uinta-Wasatch-Cache National Forest have affected areas of mule deer habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in mule deer habitat, but the quality of mule deer habitat is anticipated to improve in the long-term as a result of increased forage availability.

Potential impacts on mule deer populations in the CIAA from past and present actions and RFFAs would be a function of the type of action, and the scale, density and arrangement of each development in designated habitat (Lutz et al. 2011).

In Utah, mule deer that could be affected by the Project include the Wasatch Mountains herd, which has a current population size of 31,200, but a target population of 40,800 (UDWR 2006d). The availability and quality of crucial/critical winter range is a limiting factor for mule deer herds in the CIAA for all COUT alternative routes. Mule deer crucial/critical winter range is located in areas previously disturbed by past and present human activities, suggesting local mule deer populations tolerate some level of human activity and habitat disturbance. The majority of mule deer crucial year-long habitat follows natural river systems, which provide some protection for mule deer from development in the CIAA.

Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong mule deer displacement from habitat and increase physiological stress in populations in proximity to the two projects, although impacts on mule deer would be subject to seasonal selective mitigation measures (refer to mule deer discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of mule deer habitat and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of habitats that currently limit local mule deer herds, including the Wasatch Mountains mule deer herd that use winter range with decreasing Desired Component Index scores (15 percent over the last 5 years) (UDWR 2006d). However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-76). Under all COUT alternative routes, the majority of available mule deer habitat in Colorado and Utah would remain undisturbed by the Project and other actions in the CIAA (Table 4-76).

Pronghorn

The estimated area (in acres) of cumulative development in pronghorn habitats is summarized in Table 4-77.

TABLE 4-77
PRONGHORN HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
Fawning Areas						
COUT-A	421,678	37,071	2,154	663	39,888	381,790
COUT-B	728,872	54,564	8,959	648	64,171	664,701
COUT-C (Agency and Applicant Preferred Alternative)	858,879	88,048	9,071	819	97,938	760,940
COUT-H	858,879	88,048	9,071	812	97,931	760,948
COUT-I	1,121,237	95,023	12,063	1,058	108,145	1,013,092

TABLE 4-77
PRONGHORN HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

		No Action Alternative				
Alternative Route	**Total Available Resource**	**Past and Present Development**	**Reasonably Foreseeable Future Actions**	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**
Crucial Year-long						
COUT-A	597,487	42,418	2,359	663	45,441	552,046
COUT-B	918,159	60,916	9,165	648	70,728	847,431
COUT-C (Agency and Applicant Preferred Alternative)	1,048,165	94,400	9,277	819	104,495	943,670
COUT-H	1,048,165	94,400	9,277	812	104,488	943,677
COUT-I	1,693,999	103,768	12,269	1,115	117,152	1,576,847
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated pronghorn habitats from any of the COUT alternative routes would contribute to the cumulative loss, fragmentation, and degradation of pronghorn habitats in the CIAA (Table 4-77).

Past and present actions in the CIAA for all COUT alternative routes that have affected designated pronghorn habitat include:

- oil and gas development
- oil shale and tar sands development
- coal mining
- development of recreation sites
- construction of transportation infrastructure
- military training
- mineral leasing

RFFAs in the CIAA for all COUT alternative routes include:

- oil and gas development
- construction of power generation facilities
- development of recreation sites
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, pronghorn habitat affected by vegetation management occurs in the CIAA for all COUT alternative routes. BLM Vernal Field Office habitat/rangeland management projects have affected areas of pronghorn habitat in the CIAA. Vegetation management is anticipated to improve the quality of pronghorn habitat as a result of increased forage availability.

Potential impacts on pronghorn populations in the CIAA from past and present actions and RFFAs could be a function of the location and type of development in relation to the location of pronghorn designated habitat. Development that includes fences or roads can sever pronghorn migration corridors and restrict movement between seasonal ranges and watering and feeding areas (Sawyer et al. 2002) that could have greater impacts on pronghorn population viability in the CIAA than development that does not restrict their movement.

In Utah the current statewide pronghorn population is estimated at 12,000 to 14,000 animals in 29 subpopulations (UDWR 2009b). Ongoing loss, fragmentation, and alteration of habitat from energy development, the availability of crucial/severe winter range, water, and quality spring forage are limiting factors for pronghorn in the CIAA (UDWR 2009b). Pronghorn habitat affected by any of the COUT alternative routes is located in areas previously disturbed by past and present human activities, suggesting local pronghorn populations tolerate some level of human activity and habitat disturbance. However, individual response of pronghorn to energy development can vary from tolerance to strong avoidance (Berger et al. 2007).

Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong pronghorn displacement from habitat in proximity to the two projects, although impacts on pronghorn would be subject to seasonal selective mitigation measures (refer to pronghorn discussion for the WYCO alternative routes). Overall, the Project would contribute to past and future modification of pronghorn habitat, and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and modification of resources limiting local pronghorn herds in the CIAA. However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-77). Under all COUT alternative routes, the majority of available pronghorn habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-77).

Moose

The estimated area (in acres) of cumulative development in moose habitats is summarized in Table 4-78.

TABLE 4-78
MOOSE HABITAT CUMULATIVE EFFECTS SUMMARY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
Calving Grounds						
COUT-A	238,515	8,518	423	0	8,941	229,575
COUT-B	238,515	8,518	423	8	8,949	229,566
COUT-C (Agency and Applicant Preferred Alternative)	238,515	8,518	423	48	8,989	229,527
COUT-H	147,993	7,632	420	5	8,057	139,936
COUT-I	111,449	6,999	325	8	7,332	104,116
Crucial Spring/Fall Range						
COUT-A	187,874	2,981	5,357	221	8,558	179,315
COUT-B	187,874	2,981	5,357	0	8,337	179,537
COUT-C (Agency and Applicant Preferred Alternative)	187,874	2,981	5,357	0	8,337	179,537
COUT-H	4,977	41	6	0	47	4,930
COUT-I	0	0	0	0	0	0
Severe Winter Range						
COUT-A	1,177,119	113,970	2,826	189	116,986	1,060,133
COUT-B	1,319,148	133,667	4,507	69	138,243	1,180,905

TABLE 4-78
MOOSE HABITAT CUMULATIVE EFFECTS SUMMARY
FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	**Reasonably Foreseeable Future Actions**			
COUT-C (Agency and Applicant Preferred Alternative)	1,224,449	132,114	4,436	640	137,189	1,087,260
COUT-H	1,213,836	131,722	4,297	81	136,100	1,077,736
COUT-I	910,115	116,167	2,682	333	119,181	790,934
Crucial Year-long						
COUT-A	1,100,932	15,683	424	0	16,107	1,084,825
COUT-B	1,100,932	15,683	424	8	16,115	1,084,817
COUT-C (Agency and Applicant Preferred Alternative)	190,267	8,081	420	48	8,549	181,217
COUT-H	153,733	7,679	420	5	8,105	145,629
COUT-I	111,449	6,999	325	8	7,332	104,116
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

The loss, fragmentation, and modification of designated moose habitats from any of the COUT alternative routes would contribute to the cumulative loss, fragmentation, and degradation of moose habitats in the CIAA (Table 4-78.

Past and present actions in the CIAA for all COUT alternative routes that have affected designated moose habitat include:

- oil and gas development
- coal mining
- mineral leasing
- residential development

RFFAs in the CIAA for all COUT alternative routes include:

- coal mining
- vegetation management
- transportation infrastructure
- residential development
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, moose habitat affected by wildfires and vegetation management occur in the CIAA for all COUT alternative routes. The Seeley (2012) and Church Camp (2012) fires in Utah, and the Sheep Creek Vegetation Management Project on the Uinta-Wasatch-Cache National Forest have affected areas of moose habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in moose habitat, but the quality of moose habitat is anticipated to improve in the long-term as a result of increased forage availability.

The moose population in Utah is currently estimated at 3,200 animals, and populations have intentionally been reduced, particularly in northern Utah, since 2005 as they have reached or exceeded carrying capacity of available habitat (UDWR 2009a). Habitat degradation and the availability of quality crucial habitat are limiting factors for moose populations in the CIAA for all COUT alternative routes. Moose crucial habitat affected by any of the COUT alternative routes is located in areas previously disturbed by past and present human activities, suggesting local moose populations tolerate human activity and habitat disturbance to some extent (UDWR 2009a).

Synergistic temporal effects from construction and stabilization of the Project and the TransWest Express Transmission Project could prolong moose displacement from habitat in proximity to the two projects, although impacts on moose would be subject to seasonal selective mitigation measures (refer to moose discussion for the COUT BAX alternative routes). Overall, the Project would contribute to past and future modification of moose habitat, and the cumulative disturbance from all actions considered could contribute to loss, fragmentation, and degradation of habitat that limits local moose populations that are currently above carrying capacity of local resources in the CIAA. However, the effects of the Project would be anticipated to be small compared to the effects of other actions (Table 4-78). Under all COUT alternative routes, the majority of available moose habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-78).

Rocky Mountain Bighorn Sheep

The estimated area (in acres) of cumulative disturbance on Rocky Mountain bighorn sheep habitat is summarized in Table 4-79.

TABLE 4-79
ROCKY MOUNTAIN BIGHORN SHEEP HABITAT
CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	544,197	17,490	1,812	0	19,302	524,895
COUT-B	895,479	28,695	1,893	0	30,588	864,891
COUT-C (Agency and Applicant Preferred Alternative)	1,211,652	73,400	2,057	136	75,593	1,136,059
COUT-H	1,201,175	73,087	696	132	73,914	1,127,261
COUT-I	1,041,340	62,976	276	130	63,382	977,959

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

The loss, fragmentation, and modification of designated Rocky Mountain bighorn sheep habitat from any of the COUT alternative routes would contribute to the cumulative loss, fragmentation, and degradation of Rocky Mountain bighorn sheep habitat in the CIAA with the exception that Alternatives COUT-A and COUT-B would not affect habitat (Table 4-79).

Past and present actions in the CIAA for all COUT alternative routes that have affected designated Rocky Mountain bighorn sheep habitat include:

- oil and gas development
- oil shale and tar sands development
- coal mining

- pipelines
- mineral leasing
- development of educational areas

RFFAs in the CIAA for all COUT alternative routes include:

- oil and gas development
- residential development
- TransWest Express Transmission Project

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, Rocky Mountain bighorn sheep habitat affected by wildfires occurs within the CIAA for all COUT alternative routes. The Salt Creek (2007) and Church Camp (2012) fires in Utah have affected areas of Rocky Mountain bighorn sheep habitat in the CIAA, although the majority of Rocky Mountain bighorn sheep habitat in the CIAA was unaffected by these fires. Wildfires may result in initial temporary losses in Rocky Mountain bighorn sheep habitat, but the quality of Rocky Mountain bighorn sheep habitat is anticipated to improve in the long-term as a result of increased forage availability.

In Utah, restoration efforts for Rocky Mountain bighorn sheep over the last 40 years have included transplanting animals (approximately 900 animals) to suitable habitat in the state. Many of those transplants have failed, and the current estimated population in Utah is 1,900 sheep (UDWR 2008a). Limiting factors for Rocky Mountain bighorn sheep in the CIAA include loss of crucial habitat due to development, forage competition with ungulates, extreme weather, predation and disease (UDWR 2008a). Loss of quality habitat has corresponded with a reduction in Rocky Mountain bighorn sheep population numbers across its range (Beecham et al. 2007; Deforge 1972). A portion of Rocky Mountain bighorn sheep crucial year-long habitat affected by any of the COUT alternative routes is located in areas previously disturbed by past and present human activities. Rocky Mountain sheep can habituate to human activity and presence if activity is somewhat predictable temporally and spatially but can be adversely affected by less predictable actions (such as recreation, or development), which can result in a change in area use, abandonment of ranges, and disease onset through physiological stress (UDWR 2008a). The majority of crucial year-long habitat follows natural river systems, which provide some protection for Rocky Mountain bighorn sheep from development in the CIAA.

Disturbance from construction and stabilization of any of the COUT alternative routes could overlap temporally with the construction and stabilization activities of the TransWest Express Transmission Project and could result in synergistic temporal effects that prolong Rocky Mountain bighorn sheep avoidance from crucial habitat in proximity to the two transmission lines. Impacts on Rocky Mountain bighorn sheep from both transmission line projects would be minimized or avoided through implementation of seasonal restrictions. Overall, the Project would contribute to past and future modification of Rocky Mountain bighorn sheep crucial year-long habitat, and the cumulative disturbance from all actions considered could contribute to loss of crucial habitat and a reduction in habitat quality that currently limits Rocky Mountain bighorn sheep populations in the CIAA (linked to corresponding losses in bighorn populations) (Deforge 1972). However, the effects of the Project are anticipated to be small compared to the effects of other actions (Table 4-79). Under all COUT alternative routes, the majority of available Rocky Mountain bighorn sheep crucial year-long habitat would remain undisturbed by the Project and other actions in the CIAA (Table 4-79).

4.3.8 Special Status Wildlife

The section addresses potential cumulative effects of the Project in addition to past and present actions and RFFAs on special status wildlife resources. Resources addressed in this section are those described in Section 3.2.8.

The approach for analysis of cumulative effects on special status wildlife resources, including the geographic and temporal scopes of analysis, is presented in Table 4-3. The cumulative effects analysis for special status wildlife considers direct and indirect impacts from the Project (described in Section 3.2.8) in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2. Potential habitat models, known greater sage-grouse habitat, and lek location data were used to assess cumulative effects on special status wildlife and were obtained from BLM, WGFD, CPW, and UDWR (Table 4-80). For instances where limited data were available for a given special status wildlife species likely to occur in the Project area, a qualitative evaluation of the potential cumulative effects was performed. For information regarding species life histories and a list of species that may potentially occur in the Project area that support the analysis of cumulative effects, refer to Section 3.2.8.4 and Appendix J.

CIAAs were established for special status wildlife based on available information regarding species-specific home ranges or territory sizes. The geographic scope for analysis of cumulative effects on special status wildlife resources is identified by species in Table 4-80. For the purposes of this analysis, home ranges/territories were assumed to be circular; CIAAs include the 250-foot-wide right-of-way for each alternative route and the adjacent potentially suitable habitat in a distance equal to one home range/territory diameter on either side of the right-of-way to encompass habitat area used by all affected individuals of a given species in its territory or home range distance from the right-of-way.

4.3.8.1 Issues Identified for Analysis

4.3.8.1.1 Loss, Modification, and Fragmentation of Special Status Species Habitat

The effects of the Project could contribute (to varying degrees) to existing and ongoing loss, fragmentation, and modification of vegetation and terrain that provide potential habitat for special status wildlife. The quality and quantity of special status wildlife habitats (e.g., riparian corridors that support southwestern willow flycatchers and contiguous sagebrush habitats that support sage-grouse) are necessary for maintaining viable populations of special status wildlife species. Direct and indirect effects of any one past, present, or future action may not affect special status wildlife species or their habitat to the degree that existing populations would be affected. The combined incremental effects of all past, present, and future actions, however, could be extensive and occur over the majority of the available habitat in the Project area for some special status wildlife species. The modification and fragmentation of special status wildlife habitats potentially could result in shifts in species composition and diversity in the Project area.

An analysis of the Project's impacts relative to USFS LRMP standards and guidelines including thresholds for disturbance to designated sage-grouse habitat on USFS-administered land are included in the Special Status Wildlife Report (USFS 2015b).

TABLE 4-80
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR SPECIAL STATUS SPECIES

Habitat Types	Cumulative Impacts Analysis Area (distance on either side of right-of-way)[1]	Rationale	Type and Source of Spatial Data
Birds			
Greater sage-grouse core areas or priority habitat Greater sage-grouse general habitat and transmission line corridors designated in Wyoming Executive Order 2011-5	11 miles	Sage-grouse that attend leks up to 18 kilometers (11 miles) from the Project may be indirectly affected by the loss of habitat functionality during other seasons of the year (Connelly et al. 2000).	Overall distribution (CPW 2012h); Lek locations (CPW 2014b; UDWR 2014a; WGFD 2013); Core habitat areas (WGFD 2010b); Preliminary priority and preliminary general habitats (CPW 2012h); Occupied habitats (UDWR 2012d)
Mexican Spotted Owl Potential Habitat	1 mile	Human activities within 0.5 mile of nest sites may adversely affect nest success (Romin and Muck 2002). A 1.0-mile area around the potential right-of-way would encompass human activities within 0.5 mile of Mexican spotted owl nest sites that may be affected by the Project.	Modeled habitat in study corridors (EPG 2013)
Mountain Plover Potential Habitat	1,320 feet	Project disturbance buffers around active mountain plover nests vary with topography, type of activity proposed, and duration of disturbance. For disturbances including human presence and continual equipment operations, a 0.25-mile (1,320-foot) buffer is recommended (BLM 2011o).	Modeled habitat in study corridors (EPG 2013)
Southwestern Willow Flycatcher Potential Habitat	1 mile	A 1.0-mile area around the potential right-of-way would encompass human activities within 0.5 mile of suitable riparian habitat for southwestern willow flycatcher that may be affected by the Project.	Modeled habitat in study corridors (EPG 2012)

TABLE 4-80
CUMULATIVE IMPACTS ANALYSIS AREAS AND RATIONALE FOR SPECIAL STATUS SPECIES

Habitat Types	Cumulative Impacts Analysis Area (distance on either side of right-of-way)[1]	Rationale	Type and Source of Spatial Data
Yellow-billed Cuckoo Potential Habitat	1,656 feet	Preferred yellow-billed cuckoo nesting sites are areas with at least 15 to 20 hectares (used 20 hectares) of deciduous/riparian forest (Wiggins 2005). A point buffered[2] by 20 hectares (200,000 square meters) has a diameter of 1,656 feet.	Modeled habitat in study corridors (EPG 2014)
Mammals			
Black-footed Ferret Management Areas	1.3 miles	The minimal area required to sustain a ferret is 167 to 355 hectares (used 355) in white-tailed prairie dog habitat (4 prairie dogs per hectare) (Stromberg et al. 1983). A point buffered[2] by 355 hectares (1.37 square miles) has a diameter of 1.3 miles.	Black footed-ferret management areas (BLM 2012b, i;CPW 2012) Reintroduction sites (BLM 2012; FWS 2011c)
White-tailed Prairie Dog Potential Colonies	524 feet	Clark (1973) found that adult female white-tailed prairie dogs had the largest average home range size (1.9 hectares, rounded to 2 hectares), compared to juvenile females and males of all ages. A point buffered[2] by 2 hectares (20,000 square meters) has a diameter of 524 feet.	Modeled colonies in study corridors (EPG 2014)
Pygmy Rabbit Potential Habitat	1.8 miles	Pygmy rabbits may disperse up to 1.8 miles from known burrow sites (Estes-Zumpf and Rachlow 2009).	Modeled habitat in study corridors (EPG 2014)

NOTES:
[1] Cumulative impacts analysis areas were established for special status wildlife potential habitats based on available information regarding species-specific home range or territory size.
[2] Home ranges/territories were assumed to be circular; cumulative impacts analysis areas include the 250-foot right-of-way for each alternative route and the adjacent potentially suitable habitat in a distance equal to one home range/territory diameter on either side of the right-of-way.

4.3.8.1.2 Long-term Persistence of Special Status Wildlife in the Project Area

Due to a growing concern for the long-term persistence of species in areas of overlapping past and present actions and RFFAs, special status wildlife issues have been identified by resource agencies.

Long-term persistence of special status wildlife populations in the Project area could be threatened through cumulative detrimental direct and indirect impacts of past, present, and future actions to individuals and populations (refer to Section 3.2.8.4). Long-term persistence of special status wildlife also could be adversely affected if biological thresholds, such as minimum effective territory size (Ehrlich et al. 1988) and dispersal distances or minimum patch size and connectivity between suitable habitats (Oliver 2004), are no longer met due to the combined cumulative impacts of past, present, and future actions occurring in the CIAAs.

4.3.8.1.3 Synergistic Temporal Effects with Other Actions

The potential for synergistic (interaction and compounded) adverse effects on special status wildlife resulting from the construction of the Project and the TransWest Express Project was identified by the agencies and public during scoping. This analysis assumes the selected route for the Project and the selected routes for the TransWest Express Project would be colocated in the same 2-mile-wide study corridor. Construction of the Project would potentially overlap construction and site stabilization efforts for the TransWest Express Project. Overlapping or repeated disturbance during construction and reclamation periods for the two projects could result in prolonged displacement of special status wildlife from important habitats, displacement of species from a larger geographic area, alteration of special status wildlife behavior or movement patterns and could extend the potential recovery time of special status wildlife resources.

4.3.8.1.4 Past, Present, and Other Reasonably Foreseeable Future Actions in the Special Status Wildlife Cumulative Impacts Analysis Areas

Land administered by the Ashley, Manti-La Sal, and Uinta National Forests and the BLM in the Project area are managed for multiple-resource use. Past and present actions and RFFAs in the CIAAs, include timber harvest, livestock grazing, recreational use (e.g., off-road-vehicle use, biking, hiking, camping, and hunting), oil and gas exploration and development, mining, mineral production, transmission lines, pipelines, highways, wind and solar energy development, military training/testing, residential subdivision expansion, and communication site development. The combined actions contribute to incremental loss, alteration, and fragmentation of foraging, nesting, breeding habitat and refuge and/or escape cover for special status wildlife species. These actions have contributed to modification of the landscape in the past and will continue to contribute to this modification into the foreseeable future. Despite these incremental modifications of natural landscapes, the functionality of habitats that support special status wildlife species are maintained on the majority of USFS- and BLM-administered land and privately owned land. However, future actions will continue to adversely affect local special status wildlife populations as well as habitat functionality and quality in the CIAA for each species.

Adverse impacts on special status wildlife could be particularly intense if development occurs in areas where specialized habitat types are limited (e.g., riparian corridors that support special status migratory birds or contiguous sagebrush habitats that support sage-grouse). Surrounding habitat may not provide the same limited and specialized habitat attributes and, therefore, is unlikely to accommodate displaced individuals whose limited, specialized habitat areas would be affected (Watkins et al 2007). For a comprehensive summary of past and present actions and RFFAs refer to Tables 4-1 and 4-2.

In addition to RFFAs identified in Tables 4-1 and 4-2, BLM and USFS have proposed RMP and LRMP amendments to manage sage-grouse habitats in the Project area. If approved, the proposed BLM RMP and USFS LRMP amendments would adopt conservation measures to protect sage-grouse habitat on BLM- and USFS-administered lands and would restrict the type and location of activities that could be authorized in sage-grouse habitat by the agencies. The amendment of these RMPs and LRMPs would benefit sage-grouse and sage-grouse habitat by protecting it from further degradation and promoting conservation actions. These management alternatives also would restrict some of the RFFAs proposed in sage-grouse habitat identified in Tables 4-1 and 4-2. This may result in a decrease in the amount of sage-grouse habitat affected cumulatively by all alternative routes and other past and present actions and RFFAs (Tables 4-83 to 4-86, 4-94 to 4-96, and 4-104 to 4-106), though the amount of decrease cannot be calculated at this time.

Additionally, states and sage-grouse local working groups are currently revising sage-grouse management plans used to manage sage-grouse habitats in the Project area. Similar to the revision of BLM RMPs and USFS LRMPs, revisions to state and local working group sage-grouse management plans would likely result in more restrictive management of sage-grouse and sage-grouse habitat in the Project area. This may result in beneficial conservation actions being taken to improve sage-grouse habitats, increase sage-grouse habitat connectivity, and decrease the amount of sage-grouse habitat affected cumulatively by all alternative routes and other past and present actions and RFFAs (Tables 4-83 to 4-86, 4-94 to 4-96, and 4-104 to 4-106), though the amount of decrease cannot be calculated at this time.

4.3.8.2 Existing Condition

Conversion of native vegetation to agricultural use through vegetation clearance, deforestation and cultivation since European settlement and expansion began in the middle of the nineteenth century has significantly affected the character of landscapes and the quantity and quality of habitats for special status wildlife resources in the CIAA for each species (Huston 2005). Construction of settlements, transportation systems, and increases in human population growth, the recreational industry (Leung et al. 2000) and energy development also have resulted in further conversion of habitats for special status wildlife resources and significant shifts in the abundance, distribution, and species composition of the fauna and flora of the area. These historic modifications to the landscape have resulted in baseline conditions and trends to which the Project and other current, future and RFFAs (refer to Tables 4-1 and 4-2) analyzed in this section could contribute continuing and additive cumulative effects.

Incremental modification of the landscape and increased adverse impacts resulting from habitat loss and fragmentation on local special status wildlife habitats and their associated populations will continue as development of current and future projects occur. Energy generation and mineral exploration development continue to incrementally affect population dynamics, habitat quality, and availability for special status wildlife species in the CIAAs. Habitat fragmentation due to an increase in extent and frequency of human activity, land-use changes, and road and fencing density could increase the potential for species mortality and alter and restrict large-scale movement patterns and seasonal migrations (Andrén 1994; Franklin et al. 2002).

Construction and use of new access roads also could affect the behavior, health, fitness, and reproductive rates of special status wildlife through increased recreational activity, human presence/activity, and noise in previously undisturbed habitat (Bowles 1995, Leung et al. 2000). However, sensitivity to anthropogenic disturbance is likely to be species specific and vary among individuals within a species. As habitat loss and fragmentation steadily continue, additional loss and degradation of special status wildlife habitat quality and function due to range overlap with incrementally spreading energy generation and transmission development could occur and affect forage quality and carrying capacity for native special status species (Connelly et al. 2004). Livestock grazing could continue to potentially alter plant assemblages and increase exotic grass introduction, potentially impacting fire regimes and habitat effectiveness.

4.3.8.3 Results

4.1.1.1.1 Qualitative Assessment of Cumulative Impacts on Special Status Wildlife Resources

Upland Game Birds

For species for which agency or modeled data were not available, cumulative effects on some special status birds and their habitats likely to occur in the Project area could not be quantified although effects on these resources could occur as a result of impacts associated with the Project, past and present actions, and RFFAs. Appendix J contains information about the current distribution, habitat requirements, and population trends for special status birds that may be affected by the Project. Similar to other resources described in Section 4.3.7, the current distribution and population trends for these species in the Project area are a result of the effects of past and present actions (Table 4-1) that have modified the landscape and affected the quality and quantity of resources necessary to maintain long-term sustainability of special status bird species in the Project area.

The Project and other RFFAs would contribute to the ongoing and past modification of the landscape and effects on the quality and quantity of resources required by special status birds to maintain long-term species persistence in the Project area. The Project's contribution to these effects would be incremental and minor in comparison to the landscape-scale effects of past and other present actions and RFFAs (Tables 4-1 and 4-2).

The habitats crossed by the WYCO, COUT BAX, and COUT alternative routes are similar and these habitats have been and will continue to be affected by similar past and present actions and RFFAs. Therefore, the effects on special status birds are anticipated to be similar in nature and extent among the alternative routes and the types of effects would be similar to those described for migratory birds included in Section 4.3.9.

Mammals

All alternative routes would contribute to the cumulative loss, fragmentation, and modification of special status mammal habitats resulting from the past and present actions and RFFAs in the CIAA (refer to Section 4.3.7). Appendix J contains information about the current distribution, habitat requirements, and population trends for special status mammals that could be affected by the Project including species not analyzed in detail in this cumulative impacts analysis.

Reptiles

All alternative routes considered for the Project could contribute to cumulative impacts on special status reptiles (e.g., midget-faded rattle snake, Great Basin gopher snake, northern tree lizard). All Project alternative routes could have a cumulative effect on the availability of specialized habitats, the effectiveness of a given occupied habitat area at providing cover from predators, and open inter-shrub space for movement and reduction in predator detection between refuges for special status reptiles (Newbold 2005, Stebbins 2003, Vitt 1994).

Appendix J contains information including the current distribution, habitat requirements, and population trends for special status reptiles that could be affected by the Project.

4.3.8.3.1 Synergistic Temporal Effects with Other Actions

Construction and site stabilization of the Project may follow, or could potentially overlap with construction and reclamation efforts for the TransWest Express Transmission Project. Synergistic temporal effects on disturbance and species recovery would be likely to occur. Prolonged interactive effects resulting from construction of these two projects would contribute to the overall cumulative effects on special status wildlife and their associated habitats. In addition, construction and site stabilization of the two projects potentially could intensify short-term impacts on special status wildlife resources where the projects are colocated.

Short-term cumulative impacts could include the incremental increase and prolonged human presence, and an increase in the length of time that special status wildlife are at risk of mortality from collision with construction equipment. Long-term cumulative impacts on special status wildlife, including loss and fragmentation of potential habitats, an increase in raptor perch sites and subsequent change in raptor species composition and a decrease in prey availability, and an increase in probability of raptor mortality due to collisions with transmission line towers or line, also could occur and be intensified where the projects are colocated.

Some synergistic temporal effects resulting from construction of the projects, including repeated temporary displacement of special status wildlife from specialized and geographically limited habitats or the effects of multiple temporally overlapping actions that may displace individuals from specialized habitats from a larger geographic area, would be minimized or avoided through implementation of seasonal restrictions for both projects. For species that use specialized habitats year-round, some synergistic temporal effects resulting from construction projects may not be avoided.

4.3.8.3.2 Quantitative Assessment of Cumulative Impacts on Special Status Wildlife Resources

Quantitative analysis of cumulative effects on special status wildlife resources was completed through an inventory of available agency or modeled potential habitat (Table 4-80) for each species and an estimation of the extent of development in these habitats associated with the Project, other past and present actions, and RFFAs. Areas affected by wildfires were excluded from the quantitative analysis, as vegetation communities can recover from these events. Recovery from wildfires depends on the time since the occurrence, precipitation amounts, plant species, and degree of associated degradation (weed invasion, soil loss, and fire intensity). Vegetation management areas were also excluded for similar reasons; additionally, these areas were assumed to have beneficial effects.

The extent of special status wildlife habitats (in acres) in the CIAA was determined using information provided by land-management agencies. The extent of development associated with the other past and present actions, and RFFAs was estimated using shapefiles of specific projects received from agencies and local governments. The extent of ground disturbance associated with the Project was estimated by alternative route as described in Section 2.5.1.2.

Analysis of cumulative effects was performed for special status wildlife resources potentially affected for the Project. The results of this analysis for each special status wildlife resource analyzed qualitatively are described in this section. The estimated area of incremental Project development shown in the following tables indicates where Project development would occur outside of areas associated with past and other present actions or RFFAs. Based on available data, quantitative analysis of cumulative impacts was conducted for the following special status wildlife resources:

- Southwestern willow flycatcher potential habitat
- Yellow-billed cuckoo potential habitat

- Mountain plover potential habitat
- Mexican spotted owl potential habitat
- Greater sage-grouse designated habitats
- Pygmy rabbit potential habitat
- White-tailed prairie dog potential colonies
- Black-footed ferret management areas

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Southwestern Willow Flycatcher Potential Habitat

Since the WYCO alternative routes would have no direct or indirect impacts on potential southwestern willow flycatcher habitat, cumulative effects on this habitat were not analyzed.

Yellow-billed Cuckoo Potential Habitat

The estimated area of cumulative development in potential yellow-billed cuckoo habitat for the WYCO alternative routes is summarized in Table 4-81.

TABLE 4-81
YELLOW-BILLED CUCKOO POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	50	2	0	0	2	47
WYCO-C	50	2	0	0	2	47
WYCO-D	377	49	1	13	63	314
WYCO-F	50	2	0	0	2	47

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected yellow-billed cuckoo potential habitat in the CIAA include oil and gas development and wind-energy development. An RFFA in the CIAA for yellow-billed cuckoo is the TransWest Express Transmission Project. Yellow-billed cuckoo potential habitat has not been affected by recent wildfires or vegetation management in the CIAA for any of the WYCO alternative routes.

The extent of development that would be associated with implementation of Alternative WYCO-D would be anticipated to contribute incrementally to fragmentation and modification of the yellow-billed cuckoo potential habitat in the CIAA. For the WYCO alternative routes, the extent of incremental Project development in yellow-billed cuckoo potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-81).

If construction and site stabilization actions for the Project along the alignments of Alternative WYCO-D overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of yellow-billed cuckoos from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Mountain Plover Potential Habitat

The estimated area of cumulative development in potential mountain plover habitat for the WYCO alternative routes is summarized in Table 4-82.

TABLE 4-82
MOUNTAIN PLOVER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	18,816	1,505	1,290	735	3,530	15,286
WYCO-C	20,757	2,429	898	765	4,092	16,666
WYCO-D	12,952	1,809	786	472	3,067	9,884
WYCO-F	18,241	1,561	1,389	633	3,483	14,658

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected mountain plover potential habitat in the CIAA include:

- coal and uranium mining
- oil and gas development
- wind and other energy development
- Gateway West Transmission Project

RFFAs in the CIAA for mountain plover include:

- TransWest Express Transmission Project
- coal mining
- oil and gas development
- wind-energy development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, mountain plover potential habitat affected by wildfires and vegetation management occurs in the CIAA for all WYCO alternative routes. Several fires in Colorado, including Winter Valley (2000), Lone Tree (2007), and Mud Springs (2007), and several BLM vegetation management activities in Colorado and Wyoming have affected areas of mountain plover potential habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in mountain plover potential habitat but may also create grassland and sparsely vegetation communities preferred by the species. The majority of mountain plover potential habitat in the CIAA was unaffected by these fires or vegetation management.

The extent of development associated with implementation of any of the WYCO alternative routes would be anticipated to contribute incrementally to fragmentation and modification of mountain plover potential habitat in the CIAA. However, mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994) and likely would continue to use habitats affected by the transmission line and ancillary facilities, access roads, and temporary work areas as well as adjacent mountain plover habitat. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-82).

If construction and site stabilization actions for the Project along the alignments of the WYCO alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of mountain plover from specialized and contiguous brood-rearing habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Mexican Spotted Owl Potential Habitat

Since the WYCO alternative routes would have no direct or indirect impact on potential Mexican spotted owl habitat, cumulative effects on this habitat were not analyzed.

Greater Sage-grouse Designated Habitats

The types of potential effects on greater sage-grouse that could occur for the WYCO alternative routes and the degree to which these effects would be avoided or mitigated are described in detail in Section 3.2.8.4. The estimated area of cumulative development in sage-grouse core areas or priority habitat, general habitat (including sage-grouse habitat in transmission line corridors designated in Wyoming Executive Order 2011-5), habitat within 4 miles of leks in core areas and priority habitat, and habitat within 4 miles of leks outside core areas and priority habitat for the WYCO alternative routes is summarized in Tables 4-83 to 4-86.

TABLE 4-83
GREATER SAGE-GROUSE CORE AREAS OR PRIORITY HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	1,121,851	41,919	15,566	411	57,896	1,063,954
WYCO-C	1,105,984	41,537	15,554	411	57,502	1,048,482
WYCO-D	1,409,262	80,842	16,555	1,195	98,593	1,310,668
WYCO-F	1,168,771	46,412	15,608	409	62,429	1,106,342

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-84
GREATER SAGE-GROUSE GENERAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	1,718,769	72,016	32,660	2,633	107,308	1,611,461
WYCO-C	1,788,417	69,929	35,630	2,563	108,123	1,680,294
WYCO-D	1,725,224	122,266	26,088	2,011	150,365	1,574,859
WYCO-F	1,824,495	87,597	33,936	2,673	124,205	1,700,290

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-85
GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	1,320,402	47,402	17,886	786	66,075	1,254,327
WYCO-C	1,300,897	46,882	17,824	785	65,492	1,235,406
WYCO-D	1,637,964	93,825	18,734	1,475	114,035	1,523,929
WYCO-F	1,398,646	54,394	17,933	782	73,109	1,325,537

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-86
GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS OUTSIDE CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	1,020,840	38,476	24,751	747	63,974	956,867
WYCO-C	1,016,900	35,847	25,631	822	62,299	954,601
WYCO-D	1,187,780	69,076	21,379	1,075	91,530	1,096,250
WYCO-F	1,124,878	47,528	25,920	974	74,422	1,050,456

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected sage-grouse designated habitats in the CIAA include:

- coal mining
- oil and gas development
- wind and other energy development
- Gateway West Transmission Project

RFFAs in the CIAA for designated sage-grouse habitats include:

- TransWest Express Transmission Project
- coal mining
- oil and gas development
- wind-energy development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats affected by wildfires and vegetation management occurs in the CIAA for all WYCO alternative routes. Numerous large fires in Colorado, including Mayberry (2006), Alkalai (2014), Winter Valley (2000), and Wolf (2012) have affected areas of sage-grouse habitat in the CIAA. The Mayberry and Alkalai fires affected priority habitat and habitat within 4 miles of leks in priority habitat in the CIAA for WYCO-B, WYCO-C and WYCO-F. The Winter Valley and Wolf fires affected priority habitat and habitat within 4 miles of leks in priority habitat in the CIAA for all WYCO alternative routes. Fires in sage-grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of sage-grouse habitats. BLM vegetation management activities in Wyoming and Colorado are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of any of the WYCO alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-83 to 4-86).

Some Project impacts on sage-grouse associated with the WYCO alternative routes in Wyoming would occur in corridors designated by Wyoming Executive Order 2011-005 or in areas where an alternative route considered for the Project is parallel to an existing EHV transmission line or other linear developments that have degraded the existing quality of sage-grouse habitats (e.g., I-80). In Wyoming, the majority of the core areas and priority habitat, as well as habitats within 4 miles of leks in core areas and priority habitats, are avoided by the WYCO alternative routes where there are no past or other present actions or RFFAs that would contribute to the cumulative fragmentation and modification of these sage-grouse habitats with high conservation value. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Tables 4-83 to 4-86).

However, some Project impacts on general sage-grouse habitats and habitats within 4 miles of leks outside of core areas and priority habitats in Wyoming would occur in areas anticipated to be unaffected by past and present actions and RFFAs. Thus, the Project would be anticipated to incrementally contribute to cumulative developments in these sage-grouse habitats outside of core and priority areas. Much of the impacts on sage-grouse associated with the WYCO alternative routes and route in Colorado would be anticipated to occur outside of existing utility corridors and in areas that have not been substantially altered by previous anthropogenic development activities. development of any of the WYCO alternative routes would further contribute to the fragmentation modification of sage-grouse core areas and priority habitats, habitats within 4 miles of leks in core areas and priority habitats, general habitats, and habitats within 4 miles of leks outside of core areas and priority habitats in the CIAA.

Past and present actions, including oil and gas development, have occurred throughout much of the south-central Wyoming portion of the Project area. The WYCO alternative routes would be located adjacent to existing disturbances, including oil and gas development, interstate highways, transmission lines, and unpaved roads in some areas of Wyoming. However, in some areas of Wyoming, alternative routes could cross habitats that have been largely unaffected by previous anthropogenic development, where the alternative route would be located in the transmission corridor designated by Wyoming Executive Order 2011-5 and in the vicinity of Flat Top Mountain between I-80 and the Wyoming/Colorado state line. In Colorado, the WYCO alternative routes also would be located in areas largely unaffected by previous anthropogenic development between the Wyoming/Colorado state line and U.S. Highway 40. Alternative routes would be parallel to existing infrastructure including a high-voltage transmission line from the junction with U.S. Highway 40 to the end of the alternative routes in Colorado.

If greater sage-grouse are observed during preconstruction surveys for the Project, selective mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, cumulative impacts on vegetation structure providing contiguous sagebrush communities in greater sage-grouse habitat could occur.

If construction and site stabilization actions for the Project along the alignments of the WYCO alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of sage-grouse from geographically limited contiguous sagebrush habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Pygmy Rabbit Potential Habitat

The estimated area of cumulative development in potential pygmy rabbit habitat for the WYCO alternative routes is summarized in Table 4-87.

TABLE 4-87
PYGMY RABBIT POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY
FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO)
ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	218,683	10,120	4,248	1,381	15,748	202,935
WYCO-C	212,959	10,280	3,916	1,318	15,514	197,445
WYCO-D	243,553	13,412	8,333	1,361	23,106	220,447
WYCO-F	235,944	11,011	5,706	1,598	18,315	235,629

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected pygmy rabbit potential habitats in the CIAA include:

- coal and uranium mining
- oil and gas development
- wind and other energy development
- Gateway West Transmission Project

RFFAs in the CIAA for pygmy rabbit include:

- TransWest Express Transmission Project
- coal mining
- oil and gas development
- wind-energy development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, pygmy rabbit potential habitat affected by wildfires and vegetation management occurs in the CIAA for all WYCO alternative routes, although the majority of pygmy rabbit potential habitat in the CIAA has been unaffected by wildfires and vegetation management. Fires in pygmy rabbit potential habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of sage-grouse habitats. BLM vegetation management activities in Wyoming and Colorado are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of the WYCO alternative routes would be anticipated to contribute incrementally to loss, fragmentation, and modification of pygmy rabbit potential habitat in the CIAA. Pygmy rabbit habitat adjacent to existing human development and linear infrastructure is likely to have incurred previously some of the effects described in Section 3.2.8.4. The magnitude of effects of the WYCO alternative routes on pygmy rabbit habitat may be reduced, relative to areas where development structures are absent in areas where the alternative routes would be adjacent to the existing human development and infrastructure. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-87).

White-tailed Prairie Dog Potential Colonies

The estimated area of cumulative development in white-tailed prairie dog potential colonies for WYCO alternative routes is summarized in Table 4-88.

TABLE 4-88
WHITE-TAILED PRAIRIE DOG POTENTIAL COLONIES CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Colonies	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Colonies
		Past and Present Development	Reasonably Foreseeable Future Actions			
WYCO-B (Agency and Applicant Preferred Alternative)	2,886	212	416	282	910	1,976
WYCO-C	3,031	486	312	233	1,031	2,001
WYCO-D	2,230	445	292	165	902	1,328
WYCO-F	2,921	213	374	276	863	2,058

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected white-tailed prairie dog potential colonies in the CIAA include:

- oil and gas development
- wind-energy development
- Gateway West Transmission Project

RFFAs in the CIAA for white-tailed prairie dog include:

- TransWest Express Transmission Project
- oil and gas development
- wind-energy development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, white-tailed prairie dog potential colonies affected by wildfires and vegetation management occurs in the CIAA for all WYCO alternative routes. The Winter Valley fire (2000) and several small fires in Colorado affected areas of white-tailed prairie dog potential colonies in the CIAA, although the majority of white-tailed prairie dog potential colonies in the CIAA was unaffected by these fires. BLM vegetation management activities in Wyoming and Colorado are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of any of the WYCO alternative routes would be anticipated to incrementally contribute to fragmentation and modification of white-tailed prairie dog potential colonies in the CIAA. Potential white-tailed prairie dog colonies adjacent to existing human development and linear infrastructure are likely to have incurred previously some of the effects described in Section 3.2.8.4. The magnitude of development associated with implementation of the WYCO alternative routes on potential white-tailed prairie dog colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative routes would be adjacent to the existing human development and infrastructure.

The majority of total available potential colonies for this species would not be developed by the Project or other cumulative actions (Table 4-88).

Black-footed Ferret Potential Habitat

The estimated area of cumulative development in black-footed ferret management areas for the WYCO alternative routes is summarized in Table 4-89.

TABLE 4-89
BLACK-FOOTED FERRET MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
WYCO-B (Agency and Applicant Preferred Alternative)	33,851	3,954	413	268	4,635	29,216
WYCO-C	33,850	3,954	413	268	4,634	29,216
WYCO-D	36,394	6,322	3,498	233	10,053	26,341
WYCO-F	33,851	3,954	413	267	4,633	29,218

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected black-footed ferret management areas in the CIAA include:

- coal mining
- oil and gas development
- wind-energy development

RFFAs in the CIAA for black-footed ferret include:

- TransWest Express Transmission Project
- coal mining

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, black-footed ferret management areas affected by wildfires occur in the CIAA for all WYCO alternative routes. Small fires in Colorado have affected black-footed ferret management areas in the CIAA, although the majority of black-footed ferret management areas in the CIAA was unaffected by these fires.

The extent of development associated with implementation of the WYCO alternative routes would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret potential habitat in the CIAA. The potential Project effects on black-footed ferret that could occur under the WYCO alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4.

The WYCO alternative routes would intersect the Shirley Basin black-footed ferret management area (MV-10a). Habitats that would be crossed in the management area are characteristically rugged terrain and are not known to support prairie dogs, which are the primary prey of black-footed ferrets. Due to the presumed lack of prairie dog towns, the area affected by the WYCO alternative routes unlikely would support black-footed ferrets at this time or in the future.

The WYCO alternative routes also would intersect the Wolf Creek black-footed ferret management area. Black footed-ferret occurrences have not been recorded since a plague event in 2008 and 2009 affected the Wolf Creek ferret population, ferrets have not been located during the last 2 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, construction and operation of the WYCO alternative routes could result in effects described in Section 3.2.8.4.

The majority of total available potential habitat for this species would not be affected by the Project or other cumulative actions (Table 4-89).

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Southwestern Willow Flycatcher Potential Habitat

The estimated area of cumulative development in potential southwestern willow flycatcher habitat for the COUT BAX alternative routes is summarized in Table 4-90.

TABLE 4-90
SOUTHWESTERN WILLOW FLYCATCHER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	884	103	3	2	108	776
COUT BAX-C	832	100	17	1	119	714
COUT BAX-E	1,742	92	604	6	702	1,040
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected southwestern willow flycatcher potential habitats in the CIAA include:

- coal and mineral mining
- oil and gas development
- pipeline corridors

RFFAs in the CIAA for southwestern willow flycatcher include:

- TransWest Express Transmission Project
- industrial development

The extent of development that would be associated with implementation of the COUT BAX alternative routes would be anticipated to occur primarily in areas affected by past and present actions or RFFAs in the southwestern willow flycatcher CIAA along COUT BAX alternative routes. The vast majority of the Project development of these alternative routes would not be anticipated to contribute to fragmentation and modification of southwestern willow flycatcher potential habitat in the CIAA. For all alternative routes, the extent of incremental Project development in southwestern willow flycatcher potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-90).

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of southwestern willow flycatcher from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Yellow-billed Cuckoo

The estimated area of cumulative development in potential yellow-billed cuckoo habitat for the COUT BAX alternative routes is summarized in Table 4-91.

TABLE 4-91
YELLOW-BILLED CUCKOO POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	456	57	12	5	73	383
COUT BAX-C	479	78	12	5	94	384
COUT BAX-E	681	72	115	11	198	482

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected yellow-billed cuckoo potential habitats in the CIAA include:

- coal and mineral mining
- oil and gas development
- pipeline corridors

RFFAs in the CIAA for yellow-billed cuckoo include:

- TransWest Express Transmission Project
- industrial development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, yellow-billed cuckoo potential habitat affected by wildfires occurs in the CIAA for all COUT-BAX alternatives. The Salt Creek Fire (2007) in Utah has affected areas of yellow-billed cuckoo potential habitat in the CIAA. Wildfires can result in substantial modification to yellow-billed cuckoo potential habitat as the large trees required for nesting habitat may take decades to become re-established on a site following a fire.

The extent of development that would be associated with implementation of the COUT BAX alternative routes would be anticipated to occur primarily in areas affected by past and present actions or RFFAs in the yellow-billed cuckoo CIAA along COUT BAX alternative routes. The vast majority of the Project development of these alternative routes would not contribute to fragmentation and modification of yellow-billed cuckoo potential habitat in the CIAA. For COUT BAX alternative routes, the extent of incremental Project development in yellow-billed cuckoo potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-91).

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of yellow-billed cuckoo from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Mountain Plover

The estimated area of cumulative development in potential mountain plover habitat for the COUT BAX alternative routes is summarized in Table 4-92.

TABLE 4-92
MOUNTAIN PLOVER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
COUT BAX-B	442	29	28	17	73	368
COUT BAX-C	442	29	28	17	73	368
COUT BAX-E	442	29	28	17	73	369

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected mountain plover potential habitats in the CIAA include:

- coal and mineral mining
- oil and gas development
- pipeline corridors

RFFAs in the CIAA for mountain plover include:

- TransWest Express Transmission Project
- industrial development

Mountain plover potential habitat has not been affected by recent wildfires or vegetation management in the CIAA for any of the COUT BAX alternative routes.

The extent of the development associated with implementation of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation modification of mountain plover habitat in the CIAA. However, mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and likely would continue to use habitats affected by the transmission line and ancillary facilities, access roads, temporary work areas, as well as adjacent mountain plover habitat. The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-92).

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of mountain plover from specialized and contiguous brood-rearing habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Mexican Spotted Owl

The estimated area of cumulative development in potential Mexican spotted owl habitat for the COUT BAX alternative routes is summarized in Table 4-93.

TABLE 4-93
MEXICAN SPOTTED OWL POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	26,171	549	328	229	1,106	25,065
COUT BAX-C	28,483	553	392	220	1,166	27,317
COUT BAX-E	24,815	541	280	219	1,040	23,774
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected Mexican spotted owl potential habitats in the CIAA include:

- fire management
- oil and gas development
- pipeline corridors

The RFFA in the CIAA for Mexican spotted owl is the TransWest Express Transmission Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, Mexican spotted owl potential habitat affected by wildfires occurs in the CIAA for all COUT-BAX alternative routes. One small fire in Colorado has affected Mexican spotted owl potential habitat in the CIAA, although the majority of Mexican spotted owl potential habitat in the CIAA was unaffected by fires.

The extent of development associated with implementation of any of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation and modification of Mexican spotted owl potential habitat in the CIAA. If Mexican spotted owls are detected during preconstruction surveys, selective mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl nesting habitat could be lost as a result of clearing of trees to maintain a safe conductor height.

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with the development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of Mexican spotted owl from specialized and geographically limited nesting habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse

The types of potential effects on greater sage-grouse that could occur for the COUT BAX alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. The estimated area of cumulative development in sage-grouse core areas or priority habitat, general habitat (including sage-grouse habitat in transmission line corridors designated in Wyoming Executive Order 2011-5), and habitat within 4 miles of leks in core areas or priority habitat for the COUT BAX alternative routes is summarized in Tables Table 4-94 through Table 4-96.

TABLE 4-94
GREATER SAGE-GROUSE CORE AREAS OR PRIORITY HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	201,678	36,326	829	126	37,281	164,397
COUT BAX-C	201,681	36,326	829	125	37,280	164,401
COUT BAX-E	264,029	41,054	1,350	232	42,635	221,394

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-95
GREATER SAGE-GROUSE GENERAL HABITAT AND TRANSMISSION LINE CORRIDORS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	138,772	12,431	873	207	13,511	125,262
COUT BAX-C	138,772	12,431	873	205	13,510	125,263
COUT BAX-E	138,772	12,431	873	204	13,508	125,265

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-96
GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS AND PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	57,043	1,341	221	0	1,562	55,482
COUT BAX-C	57,046	1,341	221	0	1,562	55,484
COUT BAX-E	67,624	1,675	221	0	1,895	65,728

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected sage-grouse designated habitats in the CIAA include:

- fire management
- coal and mineral mining
- oil and gas development
- pipeline corridors
- communication development

RFFAs in the CIAA for designated sage-grouse habitats include:

- TransWest Express Transmission Project
- coal mining
- oil and gas development
- wind-energy
- reservoir development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats affected by wildfires and vegetation management occurs in the CIAA for all COUT BAX alternative routes. Numerous large fires in Utah, including Diamond Creek (2002), Seeley (2012), Wood Hollow (2012), and Salt Creek (2007) have affected areas of sage-grouse occupied habitat in the CIAA. Fires in sage-grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of sage-grouse habitats. Sage-grouse habitat burned in the Seeley Fire is in a high precipitation zone for sagebrush, which may allow for faster sagebrush recovery than areas with low precipitation. BLM vegetation management activities in Utah include the BLM Vernal Field Office fuel treatments and fuel treatments on the Manti-La Sal National Forest, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of any of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA.

Some Project impacts on sage-grouse associated with the COUT BAX alternative routes in Colorado would be in mapped general habitat and would not occur within 4 miles of known leks. Additionally, much of the development of the COUT BAX alternative routes in Colorado would be parallel to existing disturbances, including high-traffic unpaved roads and existing oil and gas development in areas where general sage-grouse habitat would be intersected. Much of the impacts on sage-grouse associated with COUT BAX alternative routes in Utah would be in mapped habitat and would not occur within 4 miles of known leks. Additionally, much of the development of the COUT BAX alternative routes in Utah would be parallel to an existing EHV transmission line. However, sage-grouse habitats in the CIAA of the different COUT BAX alternative routes have different attributes, including population size, levels of lek attendance, stability, and connectivity to surrounding suitable habitats. Detailed descriptions of greater sage-grouse populations crossed by the COUT BAX alternative routes in Utah are located in Section 3.2.8. The magnitude of cumulative development in sage-grouse core areas or priority habitat for all COUT BAX alternative routes by sage-grouse population in Utah is summarized in Table 4-97.

The COUT BAX alternative routes would not intersect sage-grouse habitats within 4 miles of known leks, which are presumably the most important areas for maintaining statewide sage-grouse lek populations in Colorado and Utah. If greater sage-grouse are observed during preconstruction surveys for the Project, selective mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, cumulative impacts on some vegetation structure providing contiguous sagebrush communities in greater sage-grouse habitat could occur.

If construction and site stabilization actions for the Project along the alignments of the COUT BAX alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of sage-grouse from geographically limited contiguous sagebrush habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse Utah Populations Crossed by COUT BAX Alternative Routes

Detailed descriptions of greater sage-grouse populations crossed by the COUT BAX alternative routes in Utah are located in Section 3.2.8. The estimated area of cumulative disturbance to sage-grouse core areas or priority habitats for all COUT BAX alternative routes by sage-grouse population is summarized in Table 4-97.

TABLE 4-97
SAGE-GROUSE UTAH POPULATIONS (CORE AREAS OR PRIORITY HABITAT)
CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
Horn Mountain						
COUT BAX-B	48,999	6,518	133	62	6,713	42,286
COUT BAX-C	48,999	6,518	133	61	6,713	42,287
COUT BAX-E	3,594	118	0	0	118	3,475
Emma Park						
COUT BAX-B	0	0	0	0	0	0
COUT BAX-C	0	0	0	0	0	0
COUT BAX-E	54,372	10,288	0	0	10,288	44,083
Deadman's Bench						
COUT BAX-B	11,626	1,294	0	0	1,294	10,332
COUT BAX-C	11,626	1,294	0	0	1,294	10,332
COUT BAX-E	11,626	1,294	0	0	1,294	10,332

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, only habitats supporting the Horn Mountain Population are affected directly by the COUT BAX alternative routes.

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Horn Mountain population in the CIAA include:

- coal mining
- oil and gas development

The RFFA in the CIAA for sage-grouse core areas and priority habitats is the TransWest Express Transmission Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats supporting the Horn Mountain Population affected by wildfires and vegetation management occurs in the CIAA for all COUT BAX alternative routes. The Seeley Fire (2012) and several smaller fires have affected areas of sage-grouse occupied habitat supporting the Horn Mountain population in the CIAA. Fires in sage-grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Wildfires can account for substantial modification or loss of sage-grouse habitats. Sage-grouse habitat burned in the Seeley Fire is in a high precipitation zone for sagebrush, which may allow for faster sagebrush recovery than areas with low precipitation. Vegetation management activities for sage-grouse habitats supporting the Horn Mountain population in the CIAA include fuel treatments on the Manti-La Sal National Forest, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of Alternatives COUT BAX-B and COUT BAX-C would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Table 4-97). Some of the Project impacts on sage-grouse habitat supporting the Horn Mountain population associated with Alternatives COUT BAX-B and COUT BAX-C in Utah would be in mapped priority and core area habitat (as all occupied sage-grouse habitat is considered priority habitat) and would not occur within 4 miles of known leks. Additionally, much of the development of Alternatives COUT BAX-B and COUT BAX-C, where they cross the Horn Mountain area, would be parallel to an existing EHV transmission line. The majority of the total available sage-grouse core area and priority habitat supporting the Horn Mountain population would not be developed by the Project or other cumulative actions (Table 4-97).

The COUT BAX alternative routes would not intersect sage-grouse habitats within 4 miles of known leks supporting the Horn Mountain population. Presumably habitats within 4 miles of leks are the most important areas for maintaining statewide sage-grouse lek populations in Utah. Results of research projects in Colorado, Idaho, and Wyoming have indicated that approximately 80 percent of sage-grouse nests occur within 4 miles of the active lek where female grouse were captured and assumed to have bred (Colorado Greater Sage-grouse Steering Committee 2008).

Alternative COUT BAX-E crosses four habitat areas historically considered to be part of the Emma Park population; however, as sage-grouse presence has not been recently confirmed (BLM 2013c), these habitat areas were not considered for the analysis of potential impacts on this population.

White-tailed Prairie Dog Colonies

The estimated area of cumulative development in potential white-tailed prairie dog colonies for the COUT BAX alternative routes is summarized in Table 4-98.

TABLE 4-98
WHITE-TAILED PRAIRIE DOG POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	1,717	40	217	92	349	1,368
COUT BAX-C	1,909	31	270	79	380	1,529
COUT BAX-E	1,430	110	221	103	435	996
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.						

Past and present actions that have affected white-tailed prairie dog potential colonies in the CIAA include:

- coal and mineral mining
- oil and gas development
- pipeline corridors

The primary RFFA in the CIAA for white-tailed prairie dog is the TransWest Express Transmission Project.

White-tailed prairie dog potential colonies have not been affected by recent wildfires or vegetation management in the CIAA for any of the COUT BAX alternative routes.

The extent of development associated with implementation of any of the COUT BAX alternative routes would be anticipated to incrementally contribute to fragmentation and modification of white-tailed prairie dog potential colonies in the CIAA. Potential white-tailed prairie dog colonies adjacent to existing human development and linear infrastructure likely previously incurred previously some of the effects described in Section 3.2.8.4. The magnitude of effects of COUT BAX alternative routes on potential white-tailed prairie dog colonies may be reduced, relative to areas where development structures are absent, in areas where the alternative would be adjacent to the existing human development and infrastructure.

The majority of total available potential colonies for this species would not be developed by the Project or other cumulative actions (Table 4-98).

Black-footed Ferret

The estimated area of cumulative development in black-footed ferret management areas for COUT BAX alternative routes is summarized in Table 4-99.

TABLE 4-99
BLACK-FOOTED FERRET MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT BAX-B	3,432	125	139	28	291	3,140
COUT BAX-C	3,432	125	139	28	291	3,141
COUT BAX-E	3,432	125	139	28	291	3,141

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions that have affected black-footed ferret management areas in the CIAA include fire management. The RFFA in the CIAA for black-footed ferret includes the construction of the TransWest Express Transmission Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, black-footed ferret management areas affected by wildfires occur in the CIAA for all COUT BAX alternative routes. Small fires in Colorado have affected black-footed ferret management areas in the CIAA, although the majority of black-footed ferret management areas in the CIAA were unaffected by these fires.

The extent of development associated with implementation of the COUT BAX alternative routes would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret potential habitat in the CIAA. The potential Project effects on black-footed ferret that could occur under the COUT BAX alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. The COUT BAX alternative routes would intersect the Wolf Creek black-footed ferret management area. Black footed-ferret occurrences have not been recorded since a plague event in 2008 and 2009 affected the Wolf Creek ferret population, ferrets have not been located in the last 2 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, the COUT BAX alternative routes could result in the effects described in Section 3.2.8.4.

The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-99).

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Southwestern Willow Flycatcher

The estimated area of cumulative development in potential southwestern willow flycatcher habitat for the COUT alternative routes is summarized in Table 4-100.

TABLE 4-100
SOUTHWESTERN WILLOW FLYCATCHER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
Alternatives COUT-H and I						
COUT-H	10	10	0	0	10	0
COUT-I	197	43	7	1	52	145

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions in the CIAA that have affected southwestern willow flycatcher potential habitats in the CIAA include oil and gas development. The RFFA in the CIAA for southwestern willow flycatcher is the TransWest Express Transmission Project.

Southwestern willow flycatcher potential habitat has not been affected by recent wildfires or vegetation management in the CIAA for the COUT alternative routes.

The extent of development that would be associated with implementation of the COUT alternative routes would not be anticipated to contribute to fragmentation and modification of southwestern willow flycatcher potential habitat in the CIAA. For Alternatives COUT-H and COUT-I, the extent of incremental Project development in southwestern willow flycatcher potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-100). If construction and site stabilization actions for the Project along the alignment of Alternative COUT-I overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of southwestern willow flycatcher from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Yellow-billed Cuckoo

The magnitude of cumulative development in potential yellow-billed cuckoo habitat for the COUT alternative routes is summarized in Table 4-101.

TABLE 4-101
YELLOW-BILLED CUCKOO POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	1,234	558	25	16	599	636
COUT-B	1,184	240	80	13	333	851
COUT-C (Agency and Applicant Preferred Alternative)	406	78	13	8	99	306
COUT-H	350	58	12	6	76	274
COUT-I	343	56	10	7	73	270

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions in the CIAA that have affected yellow-billed cuckoo potential habitats in the CIAA include oil and gas development. The RFFAs in the CIAA for yellow-billed cuckoo include the construction of the TransWest Express Transmission Project and the Victory Pipeline Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, yellow-billed cuckoo potential habitat affected by wildfires occurs in the CIAA for all COUT alternative routes. The Salt Creek Fire (2007) in Utah has affected areas of yellow-billed cuckoo potential habitat in the CIAA. Wildfires can result in substantial modification to yellow-billed cuckoo potential habitat as the large trees required for nesting habitat may take decades to become re-established on a site following a fire.

The extent of development that would be associated with implementation of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of yellow-billed cuckoo potential habitat in the CIAA. For the COUT alternative routes, the extent of incremental Project development in yellow-billed cuckoo potential habitat accounts for a small proportion of total estimated cumulative development in the available potential habitat in the CIAA (Table 4-101). If construction and site stabilization actions for the Project along the alignments of the COUT alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of yellow-billed cuckoo from specialized and geographically limited contiguous riparian habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions. For species that use specialized habitats year-round, synergistic temporal effects resulting from construction projects may not be avoided.

Mountain Plover

The estimated area of cumulative development in potential mountain plover habitat for the COUT alternative routes is summarized in Table 4-102.

TABLE 4-102
MOUNTAIN PLOVER POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Potential Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Potential Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	6,959	593	437	289	1,319	5,640
COUT-B	8,141	773	572	286	1,632	6,510
COUT-C (Agency and Applicant Preferred Alternative)	11,670	2,955	281	428	3,664	8,006
COUT-H	11,670	2,955	281	424	3,660	8,010
COUT-I	11,670	2,955	281	417	3,653	8,017

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions in the CIAA that have affected mountain plover potential habitats in the CIAA include:

- coal and other mineral mining
- oil and gas development
- pipeline corridors
- residential and industrial development

RFFAs in the CIAA for mountain plover include:

- TransWest Express Transmission Project
- Victory Pipeline Project
- oil and gas development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, mountain plover potential habitat affected by wildfires and vegetation management occurs in the CIAA for all COUT alternative routes. Several small fires in Utah and Colorado and several BLM vegetation management activities in Utah have affected areas of mountain plover potential habitat in the CIAA. Wildfires and vegetation management may result in initial temporary losses in mountain plover potential habitat, but may also create grassland and sparsely vegetation communities preferred by the species. The majority of mountain plover potential habitat in the CIAA was unaffected by these fires or vegetation management.

The extent of development associated with implementation of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of mountain plover potential habitat in the CIAA. However, mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994) and likely would continue to use habitats affected by the transmission line and ancillary facilities, access roads, temporary work areas, and adjacent mountain plover habitat. The majority of the total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-102).

If construction and site stabilization actions for the Project along the alignments of the COUT alternative routes overlapped temporally with development of the TransWest Express Transmission Project, synergistic temporal effects, of the projects including displacement of mountain plover from specialized and contiguous brood-rearing habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Mexican Spotted Owl

The estimated area of cumulative development in potential Mexican spotted owl habitat for the COUT alternative routes is summarized in Table 4-103.

TABLE 4-103
MEXICAN SPOTTED OWL POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-B	7,634	185	185	6	376	7,258
COUT-C (Agency and Applicant Preferred Alternative)	12,789	366	492	152	1,009	11,780
COUT-H	12,868	312	512	102	925	11,943
COUT-I	17,862	1,923	509	150	2,582	15,280

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions in the CIAA that have affected Mexican spotted owl potential habitats in the CIAA include:

- oil and gas development
- pipeline corridors

The RFFA in the CIAA for Mexican spotted owl is the TransWest Express Transmission Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, Mexican spotted owl potential habitat affected by wildfires occurs in the CIAA for Alternative COUT-B. The Church Camp Fire (2012) in Utah has affected Mexican spotted owl potential habitat in the CIAA, although the majority of Mexican spotted owl potential habitat in the CIAA was unaffected by fires.

The extent of development associated with implementation of Alternatives COUT-C, COUT-H, and COUT-I would be anticipated to contribute incrementally to fragmentation and modification of Mexican spotted owl potential habitat in the CIAA. The extent of development associated with implementation of Alternatives COUT-A and COUT-B would not be anticipated to contribute as extensively to fragmentation and modification of Mexican spotted owl potential habitat in the CIAA as the other COUT alternative routes.

If Mexican spotted owls are detected during preconstruction surveys, selective mitigation measures, including seasonal and spatial avoidance, could be implemented to reduce potential effects. However, some vegetation structure in potential Mexican spotted owl habitat could be lost as a result of clearing of trees to maintain a safe conductor height.

The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-103).

If construction and site stabilization actions for the Project along the alignments of the COUT alternative routes overlapped temporally with the development of the TransWest Express Transmission Project, synergistic temporal effects, including displacement of Mexican spotted owl from specialized and geographically limited nesting habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse

The types of potential effects on greater sage-grouse that could occur for the COUT alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. The estimated area of cumulative development in sage-grouse core areas or priority habitat, general habitat (including sage-grouse habitat in transmission line corridors designated in Wyoming Executive Order 2011-5), and habitat within 4 miles of leks in core areas or priority habitat for COUT alternative routes is summarized in Tables 4-104 to 4-106.

TABLE 4-104
GREATER SAGE-GROUSE CORE AREAS OR PRIORITY HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	751,572	125,292	2,887	774	128,953	622,619
COUT-B	738,543	107,704	2,774	408	110,886	627,657
COUT-C (Agency and Applicant Preferred Alternative)	612,105	71,759	1,960	380	74,100	538,005
COUT-H	657,683	85,449	2,405	403	88,257	569,427
COUT-I	619,882	84,478	2,127	517	87,122	532,760

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-105
GREATER SAGE-GROUSE GENERAL HABITAT AND TRANSMISSION LINE CORRIDORS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	134,014	12,254	880	385	13,519	120,494
COUT-B	134,008	12,254	880	376	13,510	120,498
COUT-C (Agency and Applicant Preferred Alternative)	137,678	12,408	880	402	13,690	123,988
COUT-H	137,682	12,408	880	399	13,687	123,996
COUT-I	137,682	12,408	880	393	13,681	124,002

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-106
GREATER SAGE-GROUSE HABITAT WITHIN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	375,478	45,366	1,312	433	47,110	328,367
COUT-B	395,307	31,949	1,345	127	33,420	361,887
COUT-C (Agency and Applicant Preferred Alternative)	312,047	21,632	936	56	22,624	289,423
COUT-H	285,124	20,545	764	56	21,364	263,760
COUT-I	269,715	19,949	703	109	20,762	248,953

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions in the CIAA that have affected sage-grouse designated habitats in the CIAA include:

- coal and mineral mining
- oil and gas development
- pipeline corridors
- communication, transportation, and residential developments
- Gateway West Transmission Project

RFFAs in the CIAA for designated sage-grouse habitats include:

- TransWest Express Transmission Project
- Victory Pipeline Project
- coal mining,
- oil and gas development
- wind-energy and reservoir development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats affected by wildfires and vegetation management occurs in the CIAA for all COUT alternative routes. Numerous large fires in Utah, including Seeley (2012), Wood Hollow (2012), and Salt Creek (2007) have affected areas of sage-grouse occupied habitat in the CIAA. Fires in sage-grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of sage-grouse habitats. Sage-grouse habitat burned in the Seeley Fire is in a high precipitation zone for sagebrush, which may allow for faster sagebrush recovery than areas with low precipitation. BLM vegetation management activities in Utah include the BLM Vernal Field Office fuel treatments and habitat improvement projects, and fuel treatments on the Manti-La Sal National Forest, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of any of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-104 to 4-106).

Some of the Project impacts on sage-grouse associated with the COUT alternative routes in Colorado would be in mapped general habitat and would not cross habitats within 4 miles of leks. Additionally, much of the development of the COUT alternative routes in Colorado would be parallel to existing disturbances, including high traffic unpaved roads and existing oil and gas development in areas where general sage-grouse habitat would be intersected. The majority of the total available designated habitats for sage-grouse would not be developed by the Project or other cumulative actions (Tables 4-104 to 4-106).

Some of the Project impacts on sage-grouse associated with the COUT alternative routes in Utah would occur in areas where the alternative routes would parallel an existing high-voltage transmission line that has degraded the existing quality of sage-grouse habitats. The COUT alternative routes cross sage-grouse habitats within 4 miles of active leks, which are assumed to be the areas of highest importance for maintaining existing sage-grouse populations in Utah. However, sage-grouse habitats in the CIAA of the different COUT alternative routes have different attributes including population size, levels of lek attendance, stability, and connectivity to surrounding suitable habitats. Detailed descriptions of greater sage-grouse populations crossed by the COUT alternative routes in Utah are located in Section 3.2.8. The magnitude of cumulative development in sage-grouse core areas or priority habitat, general habitat, and habitat within 4 miles of leks in core areas for all alternative routes by sage-grouse population in Utah, is summarized in Tables 4-104 to 4-106.

If greater sage-grouse are observed during preconstruction surveys for the Project, selective mitigation measures, including seasonal and spatial avoidance, would be implemented to reduce potential effects. However, some cumulative impacts on vegetation structure providing contiguous sagebrush communities in greater sage-grouse habitat could occur.

If construction and site stabilization actions for the Project along the alignments of the COUT alternative routes may overlap temporally with the TransWest Express Transmission Project, synergistic temporal effects, including displacement of sage-grouse from geographically limited contiguous sagebrush habitats or displacement of the species from a larger geographic area, could be minimized or avoided through implementation of seasonal restrictions.

Greater Sage-grouse Utah Populations Crossed by COUT Alternative Routes

Detailed descriptions of greater sage-grouse populations crossed by the COUT alternative routes in Utah are located in Section 3.2.8.

The estimated area of cumulative development in sage-grouse core areas or priority habitat and habitat within 4 miles of leks in core areas and priority habitats for the COUT alternative routes by sage-grouse population is summarized in Tables 4-107 and 4-108.

TABLE 4-107
SAGE-GROUSE UTAH POPULATIONS (CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
South Slope Uinta Population						
COUT-A	147,677	52,607	483	150	53,240	94,437
COUT-B	97,567	28,091	490	2	28,582	68,985
Halfway Hollow Population						
COUT-A	144,657	34,103	447	222	34,772	109,885
COUT-B	144,652	34,100	447	217	34,764	109,888
Deadman's Bench Population						
COUT-A	92,194	5,510	435	160	6,105	86,088
COUT-B	92,188	5,509	435	157	6,101	86,087
COUT-C (Agency and Applicant Preferred Alternative)	121,982	15,443	435	267	16,145	105,837
COUT-H	121,984	15,444	435	265	16,143	105,841
COUT-I	121,984	15,444	435	261	16,139	105,845
Strawberry/Fruitland Population						
COUT-A	155,782	11,090	809	241	12,140	143,641
COUT-B	3,651	107	0	0	107	3,543
COUT-C (Agency and Applicant Preferred Alternative)	3,652	107	0	0	107	3,545
Emma Park Population						
COUT-A	10,335	1,003	118	0	1,121	9,214
COUT-B	148,751	16,008	801	33	16,843	131,908
COUT-C (Agency and Applicant Preferred Alternative)	148,402	15,245	801	44	16,090	132,312
COUT-H	127,831	22,400	516	0	22,917	104,914
COUT-I	67,598	11,474	453	55	11,981	55,617
Anthro Mountain Population						
COUT-A	35	5	0	0	5	31
COUT-B	50,748	2,912	0	0	2,912	47,837
COUT-C (Agency and Applicant Preferred Alternative)	74,751	6,453	129	69	6,651	68,100
COUT-H	75,239	6,501	129	69	6,698	68,540
COUT-I	75,238	6,501	129	68	6,697	68,541
Horn Mountain Population						
Alternatives COUT-H and COUT-I						
COUT-H	3,591	118	0	0	118	3,473
COUT-I	48,476	6,515	133	65	6,713	41,763

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-108
SAGE-GROUSE UTAH POPULATIONS (HABITAT IN 4 MILES OF LEKS IN CORE AREAS OR PRIORITY HABITATS) CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
South Slope Uinta Population						
COUT-A	66,873	22,011	267	129	22,407	44,466
COUT-B	42,680	7,353	267	0	7,620	35,060
Halfway Hollow Population						
COUT-A	80,479	10,604	142	72	10,818	69,661
COUT-B	80,478	10,604	142	71	10,816	69,661
Deadman's Bench Population						
COUT-A	29,311	2,009	69	43	2,121	27,190
COUT-B	29,311	2,009	69	42	2,120	27,191
COUT-C (Agency and Applicant Preferred Alternative)	29,311	2,009	69	56	2,134	27,177
COUT-H	29,311	2,009	69	56	2,133	27,177
COUT-I	29,311	2,009	69	55	2,123	27,178
Strawberry/Fruitland Population						
COUT-A	88,358	8,192	608	189	8,989	79,369
Emma Park Population						
COUT-A	1,828	58	6	0	64	1,764
COUT-B	101,282	7,643	647	14	8,304	92,978
COUT-C (Agency and Applicant Preferred Alternative)	101,281	8,901	647	0	9,548	91,733
COUT-H	73,841	7,796	475	0	8,270	65,571
COUT-I	52,587	7,082	414	55	7,551	45,036
Anthro Mountain Population						
COUT-B	32,941	1,848	0	0	1,848	31,093
COUT-C (Agency and Applicant Preferred Alternative)	32,757	1,838	0	0	1,838	30,918
COUT-H	32,941	1,848	0	0	1,848	31,093
COUT-I	32,941	1,848	0	0	1848	31,093

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

South Slope Uinta Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, core areas and priority habitats and habitats within 4 miles of leks supporting the South Slope Uinta population would be affected directly by Alternative COUT-A .

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated South Slope Uinta population in the CIAA include residential and oil and gas development. RFFAs in the CIAA for core and priority habitats include the TransWest Express Transmission Project and the Victory Pipeline Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats supporting the South Slope Uinta population affected by vegetation management occurs in the CIAA for Alternative COUT-A. BLM vegetation management activities in the CIAA for sage-grouse habitats supporting the South Slope Uinta population include BLM Vernal Field Office habitat and rangeland management activities, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of Alternative COUT-A would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-107 and 4-108).

Project impacts on sage-grouse habitat supporting the South Slope Uinta population associated with Alternative COUT-A would be in priority and core area habitat, as well as habitat within 4 miles of known leks. However, much of the development of the COUT alternative routes, where they are anticipated to cross the South Slope Uinta area, would be parallel to an existing EHV transmission line.

Halfway Hollow Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, core areas and priority habitats, and habitats within 4 miles of leks supporting the Halfway Hollow population would be affected directly by Alternative COUT-A and COUT-B.

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Halfway Hollow population in the CIAA include mineral mining and oil and gas development. The RFFA in the CIAA for core and priority habitats is the TransWest Express Project.

Sage-grouse habitats supporting the Halfway Hollow population have not been affected by recent wildfires or vegetation management in the CIAA for the COUT alternative routes.

A portion of the Project development of Alternative COUT-A and COUT-B would occur outside areas affected by past and present actions or RFFAs in the sage-grouse CIAA (Tables 4-107 and 4-108) and would contribute further to fragmentation and modification of sage-grouse designated habitats in the CIAA for this species.

Impacts on sage-grouse habitat supporting the Halfway Hollow population associated with development of Alternative COUT-A and COUT-B would be in priority and core area habitat, as well as habitat within 4 miles of known leks. Much of the development of the COUT alternative routes, where they cross the Halfway Hollow area, would parallel an existing high-voltage transmission line.

Deadman's Bench Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, core areas and priority habitats and habitats within 4 miles of leks supporting the Deadman's Bench population would be affected directly by all the COUT alternative routes.

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Deadman's Bench population in the CIAA include mineral mining and oil and gas development. RFFAs in the CIAA for core and priority habitats include the TransWest Express Project and oil and gas development.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats supporting the Deadman's Bench population affected by vegetation management occurs in the CIAA for all of the COUT alternative routes. BLM vegetation management activities in the CIAA for sage-grouse habitats supporting the Deadman's Bench population include BLM Vernal Field Office habitat and rangeland management activities, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-107 and 4-108).

Project impacts on sage-grouse habitat supporting the Deadman's Bench population associated with implementation of the COUT alternative routes would be in priority and core area habitat as well as habitat within 4 miles of known leks. Some of the development of the COUT alternative routes, where they are anticipated to cross the Deadman's Bench area, would be parallel to an existing EHV transmission line.

Strawberry/Fruitland Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, core areas and priority habitats and habitats within 4 miles of leks supporting the Strawberry/Fruitland population are directly affected by Alternative COUT-A.

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Strawberry/Fruitland population in the CIAA include residential and oil/gas development. RFFAs in the CIAA for core and priority habitats include the TransWest Express Transmission Project and oil and gas development.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats supporting the Strawberry/Fruitland population affected by vegetation management occurs in the CIAA for Alternative COUT-A. BLM vegetation management activities in the CIAA for sage-grouse habitats supporting the Strawberry/Fruitland population include BLM Vernal Field Office habitat and rangeland management activities, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of Alternative COUT-A would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse designated habitats in the CIAA (Tables 4-107 and 4-108).

Project impacts on sage-grouse habitat supporting the Strawberry/Fruitland population associated with implementation of Alternative COUT-A would be in priority and core area habitat as well as habitat within 4 miles of known leks. Much of the development of Alternative COUT-A would be parallel to an existing EHV transmission line, where they are anticipated to cross the Strawberry/Fruitland area.

Emma Park Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, core areas and priority habitats and habitats within 4 miles of leks supporting the Emma Park population would be affected directly by Alternatives COUT-B, COUT-C, and COUT-I.

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Emma Park population in the CIAA include:

- coal and other mineral mining
- residential and oil and gas development

RFFAs in the CIAA for core and priority habitats include:

- TransWest Express Transmission Project
- coal mining

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats supporting the Emma Park population affected by wildfires occurs in the CIAA for all COUT alternative routes. The Price Canyon Fire (2002) and the Mathis Fire (2007) have affected areas of sage-grouse occupied habitat supporting the Emma Park population in the CIAA. Fires in sage-grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of sage-grouse habitats. Some of the sage-grouse habitat burned in these fires was in a higher precipitation zone for sagebrush, which may allow for faster sagebrush recovery than areas with low precipitation.

The extent of development associated with implementation associated with Alternatives COUT-B and COUT-C would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats as well as habitats within 4 miles of known leks in the CIAA (Tables 4-107 and 4-108).

The extent of development associated with implementation associated with implementation of Alternatives COUT-B, COUT-C, and COUT-I would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Tables 4-107 and 4-108). However, Alternatives COUT-B and COUT-C avoid habitats within 4 miles of known leks in core areas and priority habitats supporting the Emma Park population, which are assumed to be the areas of highest importance for maintaining existing sage-grouse populations in Utah. Alternative COUT-I crosses habitats within 4 miles of leks in core areas and priority habitat outside areas affected by past and present actions or RFFAs in the sage-grouse CIAA (Tables 4-107 and 4-108) and would further contribute to fragmentation and modification of habitats within 4 miles of leks in sage-grouse core areas and priority habitats in the CIAA for this species.

Project impacts on sage-grouse habitat supporting the Emma Park population associated with Alternatives COUT-B, COUT-C, and COUT-I would be in priority and core area habitat as well as habitat within 4 miles of known leks. Where they cross the Emma Park area, Alternatives COUT-B and COUT-C would be in areas of existing oil and gas development.

Anthro Mountain Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, core areas and priority habitats and habitats within 4 miles of leks supporting the Anthro Mountain population are directly affected by Alternatives COUT-C, COUT-H, and COUT-I.

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Anthro Mountain population in the CIAA include mineral mining and oil and gas development. The RFFA in the CIAA for core and priority habitats is the TransWest Express Transmission Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats supporting the Anthro Mountain population affected by wildfires and vegetation management occurs in the CIAA for Alternatives COUT-B, COUT-C, COUT-H, and COUT-I. The Twin Hollow Fire (2009) has affected a small area of sage-grouse occupied habitat supporting the Anthro Mountain population in the CIAA. Fires in sage-grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Therefore, especially in areas with low precipitation, wildfires can account for substantial modification or loss of sage-grouse habitats. Some of the sage-grouse habitat burned in these fires was in a higher precipitation zone for sagebrush, which may allow for faster sagebrush recovery than areas with low precipitation. BLM vegetation management activities for sage-grouse habitats supporting the Anthro Mountain population in the CIAA include BLM Vernal Field Office habitat and rangeland management activities, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of Alternatives COUT-C, COUT-H, and COUT-I would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Tables 4-107 and 4-108).

Project impacts on sage-grouse habitat supporting the Anthro Mountain population associated with Alternative COUT-C, COUT-H, and COUT-I would be in priority and core area habitat but not in habitats within 4 miles of known leks in priority and core areas.

Horn Mountain Population

Of the BLM-designated sage-grouse populations in Utah (Section 3.2.8, Map 3-5) in the CIAA for the species, core areas and priority habitats and habitats within 4 miles of leks supporting the Horn Mountain population are directly affected by Alternative COUT-I.

Past and present actions that have affected sage-grouse core areas and priority habitats supporting the BLM-designated Horn Mountain population in the CIAA include:

- coal mining
- oil/gas development

The RFFA in the CIAA for core and priority habitats is the TransWest Express Transmission Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, sage-grouse habitats supporting the Horn Mountain population affected by wildfires and vegetation management occurs in the CIAA for Alternative COUT-I. Several small fires have affected a small area of sage-grouse occupied habitat supporting the Horn Mountain population in the CIAA. Fires in sage-grouse habitat may result in substantial loss of habitat that could last for decades because sagebrush does not resprout from roots following wildfires and can be slow to become re-established on a site following a fire. Re-establishment rate is largely dependent on precipitation, soil conditions, and fire severity. Wildfires can account for substantial modification or loss of sage-grouse habitats. Sage-grouse habitat supporting the Horn Mountain population is in a high precipitation zone for sagebrush, which may allow for faster sagebrush recovery than areas with low precipitation. Vegetation management activities in sage-grouse habitats supporting the Horn Mountain population in the CIAA include fuel treatments on the Manti-La Sal National Forest, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of any of the Alternative COUT-I would be anticipated to contribute incrementally to fragmentation and modification of sage-grouse core areas and priority habitats in the CIAA (Tables 4-107 and 4-108).

Project impacts on sage-grouse habitat supporting the Horn Mountain population associated with Alternative COUT-I would be in core areas and priority habitat but not within 4 miles of known leks in core areas and priority habitat. Much of the development of Alternative COUT-I where it crosses the Horn Mountain area would parallel an existing EHV transmission line.

White-tailed Prairie Dog

The estimated area of cumulative development in potential white-tailed prairie dog habitat for the COUT alternative routes is summarized in Table 4-109.

TABLE 4-109
WHITE-TAILED PRAIRIE DOG POTENTIAL HABITAT CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Habitat	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Habitat
		Past and Present Development	Reasonably Foreseeable Future Actions			
COUT-A	2,936	425	420	301	1,146	1,790
COUT-B	3,037	416	449	294	1,159	1,878
COUT-C (Agency and Applicant Preferred Alternative)	2,426	354	315	288	957	1,469
COUT-H	2,499	416	314	284	1,013	1,486
COUT-I	2,906	416	321	332	1,068	1,838

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Past and present actions in the CIAA that have affected white-tailed prairie dog potential colonies in the CIAA include:

- coal and other mineral mining
- oil and gas development
- residential and industrial development
- pipeline corridors

RFFAs in the CIAA for white-tailed prairie dog include:

- TransWest Express Transmission Project
- Victory Pipeline Project
- oil and gas development

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, white-tailed prairie dog potential colonies affected by wildfires and vegetation management occurs in the CIAA for all COUT alternative routes. The Mellen fire (2009) in Utah affected areas of white-tailed prairie dog potential colonies in the CIAA, although the majority of white-tailed prairie dog potential colonies in the CIAA was unaffected by this fire. BLM vegetation management activities in Utah include BLM Vernal Field Office fuel and habitat treatments, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of any of the COUT alternative routes would be anticipated to contribute incrementally to fragmentation and modification of white-tailed prairie dog potential colonies in the CIAA. Potential white-tailed prairie dog colonies adjacent to existing human development and linear infrastructure are likely to have previously incurred some of the effects described in Section 3.2.8.4. The magnitude of development associate with implementation of COUT alternative routes in white-tailed prairie dog potential colonies could be reduced, relative to areas where development structures are absent, in areas where the alternative routes would be adjacent to the existing human development and infrastructure.

The majority of total available potential colonies for this species would not be developed by the Project or other cumulative actions (Table 4-109).

Black-footed Ferret

The estimated area of cumulative development in black-footed ferret management areas for the COUT alternative routes is summarized in Table 4-110.

TABLE 4-110
BLACK-FOOTED FERRET MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource
COUT-A	11,272	422	324	95	840	10,432
COUT-B	11,272	422	324	92	838	10,434
COUT-C (Agency and Applicant Preferred Alternative)	16,968	642	139	159	939	16,029
COUT-H	16,968	642	139	157	938	16,030
COUT-I	16,968	642	139	155	935	16,032

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

The RFFA in the CIAA for black-footed ferret is the TransWest Express Transmission Project.

In addition to the effects of the past and present actions and RFFAs analyzed quantitatively in this section, black-footed ferret management areas affected by vegetation management occurs in the CIAA for all COUT alternative routes in Utah. Vegetation management activities include BLM Vernal Field Office fuel and habitat treatments, which are intended to result in improved wildlife habitat conditions in the CIAA.

The extent of development associated with implementation of the Alternatives COUT-A and COUT-B, would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret management area in the CIAA.

The extent of development associated with implementation of Alternatives COUT-C, COUT-H, and COUT-I would be anticipated to contribute incrementally to fragmentation and modification of black-footed ferret management area in the CIAA.

The potential effects on black-footed ferret that could occur for the COUT alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.4. The COUT alternative routes would intersect the Wolf Creek black-footed ferret management area. Black footed-ferret occurrences have not been recorded since a plague event in 2008 and 2009 affected the Wolf Creek ferret population, ferrets have not been located in the last 2 years, and reintroductions are not currently taking place (Ausmus 2012). However, if black-footed ferret reintroductions are resumed in the future, the COUT alternative routes could result in effects described in Section 3.2.8.4.

The majority of total available potential habitat for this species would not be developed by the Project or other cumulative actions (Table 4-110).

4.3.9 Migratory Birds

The section addresses potential cumulative effects on migratory birds and their habitat resulting from the Project in addition to past and present actions and RFFAs. Resources addressed in this section are the same as those described in Section 3.2.9.

Migratory birds protected under the MBTA include species and individuals that may never migrate but are protected by the MBTA, and species that may migrate across North America or between continents. The geographic scope for this cumulative effects analysis does not attempt to capture all cumulative actions throughout the range of all migratory birds that may pass through or reside in the Project area. However, this is not intended to minimize the threats that migratory birds face in various parts of their ranges. Some Neotropical migratory species observed to be declining in North America may be affected by habitat loss or other factors in Central and South America more strongly than by stressors in North America. Climate change can alter resource availability differentially across the migration routes of some species or trigger changes in migration dates (Jones and Cresswell 2010, Butler 2003). In North America, migratory birds that pass through the Project area but nest further north, up to the Arctic circle, may be affected by factors in their nesting range independently of factors they may be exposed to while crossing through the Project area. While any of these factors anywhere in each species' range may contribute to population trajectories, this analysis is intended to reflect how the Project may contribute to existing impacts on migratory birds in the Project area.

The geographic scope for the quantitative portion of this cumulative effects analysis is focused on past and present actions and RFFAs in 12-digit HUCs that would be crossed by each alternative route. The cumulative effects analysis for migratory birds considers direct and indirect impacts from the Project (described in Sections 3.2.7 and 3.2.9) in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.9.1 Issues Identified for Analysis

4.3.9.1.1 Cumulative Loss of Migratory Bird Habitat

Loss of migratory bird habitats was identified by the agencies and public during scoping as an issue relating to migratory birds. Habitat types such as wetlands and riparian vegetation are regionally rare and disproportionally valuable to migratory birds, and other habitat types such as big sagebrush are declining regionally, in part due to anthropogenic disturbance and development.

4.3.9.1.2 Cumulative Contributions to Human-caused Bird Mortality and Disturbance

Many human activities contribute to accidental deaths of migratory birds, and this was identified as an issue by the agencies and public during scoping. Collision mortality is caused in the greatest numbers by window strikes, but energy facilities such as transmission and distribution lines and wind turbines are a substantial proportion of annual collision mortality as well. Each source of collision mortality likely affects certain species or groups of species more than others. The CIAA supports ongoing energy extraction, generation, and transmission projects, which cumulatively pose a mortality risk to migratory birds.

4.3.9.2 Existing Condition

Migratory birds, particularly long-distance Neotropical migrants, face a range of man-made obstacles and landscape-scale habitat changes across their migration routes and in their nesting, migration, and wintering habitat. Because appropriate resources must be present along an entire migratory route, long-distance migrants can be highly sensitive to changes on the landscape. Climate change may further contribute to stressors on migratory birds by altering seasonal cues or by shifting resource availability in relation to migration dates. Short-distance migrants and resident birds protected under the MBTA also may be exposed to these threats and changes, but often to a lesser degree. Conservation of these species also may be more efficient and effective, as international communication and cooperation is limited.

Loss, alteration, and fragmentation of migratory bird habitat can adversely affect survival and breeding success, which can cause or contribute to population declines in migratory bird species (Finch 1991; Robinson et al. 1995). While habitat loss to permanent development is assumed to affect any bird species that may have been present, the cumulative effects of habitat alteration and vegetation change on birds can be subtle, and may not always represent a complete loss of habitat for all birds. Many bird species can use highly modified landscapes, including farmland, high-density urban areas, and logging clear-cuts. However, species adapted to disturbed habitats and resilient to human disturbance often are not declining or considered at risk.

Migratory bird species of concern identified in Table J-7 of Appendix J use the Project area at various times of the year, for nesting, migration, wintering, or as year-round residents. Many other species, not identified as bird species of concern, also are present in the Project area but are not listed individually. Breeding Bird Survey (BBS) results from 1966 to 2013 (Sauer et al. 2014) were reviewed for all species listed in Table J-6 of Appendix J to provide a summary of the general trends exhibited by bird species of concern in the Project area and the West. BBS results do provide important long-term information on apparent trends and are used by some organizations to identify priority species, but the data are not intended to provide insight into the causes of declines or trigger particular management and policy outcomes. Because the BBS reports surveys conducted during the summer nesting season, trends were not reported for species that do not nest in the areas covered by each BBS data query. The data were reviewed by species for BBS routes in the Western Region, Wyoming, Colorado, and Utah.

Some bird species naturally exhibit strong fluctuations in population levels in response to resource availability, and other species are uncommon and provided a small sample size in the BBS results. Thus, trends for many species may appear to be generally positive or negative, but are not statistically significant (i.e., the 95 percent confidence interval includes a neutral trend) in the geographic area covered by a given query. Table 4-15 presents summary results for BBS data for the 133 bird species of concern listed in Table J-6 of Appendix J.

TABLE 4-111
BREEDING BIRD SURVEY TRENDS FOR 133 SPECIAL STATUS BIRD SPECIES IN THE PROJECT AREA

Trend	Western Region	Wyoming	Colorado	Utah
Positive (Total)	34	38	42	46
Positive (Significant)	14	8	13	14
Negative (Total)	70	47	43	33
Negative (Significant)	32	6	17	10
Non-breeding in Breeding Bird Survey query	29	48	48	54

Population trends at the habitat level are considered in relation to particular habitat type and include species other than migratory species. Many wetland bird populations are increasing due to concerted conservation efforts of those habitats; however, populations associated with grassland, arid land, and forested habitats are in decline (North American Bird Conservation Initiative 2009). Many passerine populations associated with Intermountain shrub steppe and grasslands are in decline (Gilbert and Chalfoun 2011; Knick and Rotenberry 2002). In the Intermountain West, 37 shrub-steppe dependent species showed population declines, compared to a population increase in only three species (Dobkin and Sauder 2004).

Humans cause or contribute to an estimated 1 billion unintentional bird deaths annually in North America, from sources such as domestic cats, collision with buildings and other infrastructure, environmental contaminants, and numerous other causes (Erickson et al. 2005, Lilley and Firestone 2008), although a review of studies on predation by cats estimated that more birds may be killed by cats than all other sources combined under previous estimates (Loss et al. 2013). Estimates of the contribution of transmission line collisions to total human-caused mortality vary, but consistently indicate that this can be a substantial cause of mortality, particularly for high-risk species. While no single study can provide reliable estimates for collision across the geographically and biologically diverse continent, reviews of multiple studies have estimated that annual collision mortality is likely to be in the tens of millions and may be up to 10 percent of accidental human-caused bird mortality (Erickson et al. 2001, Loss et al. 2014a).

On a continental scale, factors such as collisions with buildings or domestic cat predation may be a greater threat to birds than collision with transmission lines (Loss et al. 2014b, Loss et al. 2013). However, the CIAA supports a relatively low population density with few tall buildings; and as a result, is also likely to have a relatively low domestic cat density. Also on a continental scale, hazards associated with oil and gas development and collision with wind turbines are relatively minor contributions to overall mortality (Erickson et al. 2005), but the CIAA supports substantial oil and gas development, and wind-energy production continues to increase. Wind energy in particular causes a high risk of collision to some long-lived species sensitive to additional mortality, such as the golden eagle and other raptors (Drewitt and Langston 2008).

4.3.9.3 Results

Land administered by the USFS and BLM in the Project area are managed for multiple-resource use. Past and present actions and RFFAs in the CIAA include timber harvest; livestock grazing; recreational use (e.g., off-road-vehicle use, biking, hiking, camping, and hunting); oil and gas exploration and development; mining, mineral production; transmission lines; pipelines; highways; wind and solar energy development; military training and testing; residential subdivision expansion; communication site development; and municipal and irrigation water production, protection, and storage. Past and present actions have contributed to incremental loss, alteration, and fragmentation of foraging, nesting, and breeding habitat and cover for migratory bird species. Continuation of past and present actions into the future, in addition to other RFFAs, is anticipated to contribute to the incremental modification of migratory bird habitat and disturbance of migratory birds in the CIAA. Existing and future communication towers, transmission and distribution lines, and wind-energy projects will continue to increase the collision mortality risk for migratory birds in the CIAA. For a comprehensive summary of past and present actions and RFFAs, refer to Tables 4-1 and 4-2.

In the context of this cumulative effects analysis, any action alternative would result in the creation of a transmission line between the Aeolus and Clover substations, which would result in lost habitat, disturbance during construction and operation of the Project, and the creation of a collision hazard, particularly at all major river crossings, agricultural areas, and wetlands. These impacts would occur regardless of the selected alternative route and would contribute to the ongoing and future effects of past and present actions and RFFAs, but would vary in scale and intensity approximately in proportion to the length of each alternative route.

4.3.9.3.1 Cumulative Impacts on Migratory Bird Habitat

Section 4.3.5 provides detailed comparisons of the cumulative impacts on vegetation in the CIAA for each alternative route. Because of the mobility of migratory birds, their use of multiple habitat types throughout the year, and the potential for many species to be exposed to almost any cumulative action in the CIAA, individual alternative routes are not compared for cumulative impacts in this section. This section provides a summary of the existing and projected cumulative impacts by alternative route for each habitat type analyzed in Section 4.3.5. That analysis was conducted by overlaying cumulative actions and vegetation communities, analyzed by 12-digit HUCs. However, in the context of migratory birds, an analysis at nearly any geographic scale would be anticipated to show that human impacts on migratory bird habitat are substantial and widespread, and the proportion of some types of habitat lost to development can reasonably be considered a contributor to observed declines in species populations.

Past and present actions in the CIAA include the following:

- coal mines
- communication facilities
- pipelines
- mineral leases
- oil and gas development
- oil shale development
- recreational and residential development
- wind-energy facilities
- Energy Gateway West Transmission Project

RFFAs in the CIAA include the following:

- coal mines
- industrial development
- oil and gas development
- pipelines
- power generation facilities
- recreational and residential development

- habitat restoration projects
- TransWest Express, Mona South, Mona North, and West Desert Express transmission projects

However, many of these cumulative actions were quantified conservatively in the analysis, and the total area affected by cumulative actions may be overestimated. Oil and gas leases are restricted in the total proportion of the lease that can be subject to ground disturbance, and other types of actions may cause temporary disturbance but allow migratory bird habitat to recover or remain in place. A detailed description of past and present actions and RFFAs associated with each specific habitat type crossed by the Project and likely to be used by migratory bird species is included in Section 4.3.5.

The loss, fragmentation and modification of potentially suitable migratory bird habitat under all alternative routes would contribute to the cumulative loss, fragmentation, and modification of bird and migratory bird habitat resulting from past and present actions and RFFAs in the CIAA. Past events such fires and vegetation management projects are not considered in the quantitative analysis. Although fires may temporarily reduce available habitat, and can contribute to long-term changes in some vegetation communities, they also may contribute to the long-term health of some vegetation communities such as grassland. In other vegetation communities, such as big sagebrush or riparian woodlands, fire may be a generally negative effect and can result in conversion to another vegetation community. Each of these effects can benefit some bird species and may contribute to declines in others. Vegetation management and rangeland improvement projects are not included in the quantitative analysis, as they may contribute positively to the maintenance of migratory bird habitat in some vegetation communities.

Table 4-112 presents the regional conditions and degree of habitat alteration from all cumulative actions, presented by alternative route grouping. The proportional range of affected and remaining habitat presented by alternative route in Section 4.3.5 is summarized as a range of impacts for each vegetation type, by alternative route. A detailed analysis of the acres of cumulative impacts by vegetation type, and by alternative route, is presented in each table in Section 4.3.5. Although the results in Table 4-112 provide regional context for how the Project would contribute to past and present actions and RFFAs in the CIAA, these results should be considered as an approximation of the magnitude of habitat loss and alteration but not a precise estimate of its impacts on migratory birds. Many actions in the CIAA, such as oil and gas leases, may not cause ground disturbance to the entire area leased. However, offsite effects such as noise, structure avoidance, and vegetation changes can contribute to impacts on migratory birds.

4.3.9.3.2 Cumulative Contributions to Human-caused Bird Mortality and Disturbance

The alternative routes cross similar ecosystems that support migratory birds, and the types of past and present actions and RFFAs in the CIAA for all alternative routes also are similar. Due to the similarity of resources affected and past, present, and future actions in the CIAA, many cumulative effects on migratory birds would be common to all alternative routes. Therefore, the potential effects are analyzed qualitatively. Information that supports the analysis of potential cumulative effects on migratory birds includes the quantitative analysis of cumulative impacts on vegetation communities that provide habitat for migratory birds included in Section 4.3.5.

TABLE 4-112
PROPORTION OF EACH HABITAT TYPE WITHIN THE CUMULATIVE IMPACTS ANALYSIS AREA AFFECTED BY ESTIMATED CUMULATIVE DEVELOPMENT

	Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)			Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)			Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)		
Vegetation Community	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**	**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**
Alpine	0%	0 to 10%	90 to 100%	0.1%	15 to 18%	82 to 85%	0.1 to 0.3%	10 to 29%	71 to 90%
Aspen	0%	3 to 13%	87 to 97%	0.1 to 0.2%	14 to 17%	83 to 86%	0.1 to 0.3%	5 to 19%	81 to 95%
Barren/Sparsely Vegetated	0.1 to 0.3%	4 to 6%	94 to 96%	0.2%	7 to 10%	90 to 93%	0.1 to 0.2%	6 to 10%	90 to 94%
Big Sagebrush	0.2 to 0.3%	6 to 7%	93 to 94%	0.2 to 0.3%	9 to 13%	87 to 91%	0.2 to 0.5%	8 to 14%	86 to 92%
Grassland	0.3%	4 to 5%	95 to 96%	0.2%	8 to 9%	91 to 92%	0.2 to 0.5%	6 to 16%	84 to 94%
Montane Forest	0%	0 to 1%	99 to 100%	0 to 0.1%	13 to 15%	85 to 87%	0 to 0.1%	4 to 22%	78 to 96%
Mountain Shrub	0%	1 to 24%	76 to 99%	0.2 to 0.3%	6%	94%	0.3%	3 to 9%	91 to 97%
Pinyon-Juniper	0.1 to 0.2%	2%	98%	0.1 to 0.2%	4 to 5%	95 to 96%	0.2 to 0.3%	5 to 9%	91 to 95%
Shrub/Shrub Steppe	0.2 to 0.3%	7 to 10%	90 to 93%	0.2 to 0.3%	9 to 10%	90 to 91%	0.2 to 0.3%	11 to 16%	84 to 89%
Riparian	0.2 to 0.3%	11 to 20%	80 to 89%	0.1%	24 to 41%	59 to 76%	0.1 to 0.3%	12 to 32%	68 to 88%
Water	0.1%	4 to 10%	90 to 96%	0 to 0.1%	18 to 19%	81 to 82%	0.1%	7 to 24%	76 to 93%
Wetland	0.1 to 0.2%	11 to 38%	62 to 89%	0.2%	30 to 34%	66 to 70%	0 to 0.2%	22 to 81%	19 to 78%

Conservation of migratory birds in the Intermountain West has focused on preservation and restoration of habitat. Threats to migratory species include the loss, alteration, and degradation of habitat resulting from ongoing land use change and development, invasive plant introduction, changes in fire intensity and frequency resulting from land management practices and livestock grazing, alterations of stream flows and spring development, and increases in recreation (Rich et al. 2004). Migratory bird sensitivity to, and recovery from disturbance is likely to be a function of species-specific characteristics and behavior, as well as the type of action (scale, density, and arrangement) of each development in relation to other development and occupied habitat. Developments with structures—such as communication towers, wind turbines, commercial and residential buildings, and transmission lines—or disturbance that occurs over multiple breeding seasons in proximity to important nesting, breeding, foraging, and stop-over habitats, migratory paths, and concentration areas could increase site avoidance, behavioral disturbance and mortality at the population level (Manville 2009). All action alternatives would contribute to the collision risk created by all transmission lines, particularly in areas where transmission lines cross bird landing or take-off flight paths (Janss 2000). Physiological factors that increase the risk of collision with transmission line wires are described in Section 3.2.9. Locations where the Project would be constructed parallel and adjacent to existing transmission lines would limit the area of disturbance, increase the cumulative visibility of all obstacles in the corridor, require birds to make only one flight adjustment to avoid obstacles, and potentially lower the overall collision risk (APLIC 2012; Bevanger 1994). However, locations where the Project is parallel to lower-voltage transmission lines may result in the placement of wires at different heights across the corridor, which can cause birds to avoid one obstacle but fail to detect and avoid others (APLIC 2012).

The potential for temporal and/or spatial synergistic, adverse effects on migratory birds resulting from the construction of the Project and other transmission line projects (i.e., the TransWest Express and Gateway West transmission projects) was identified. This analysis assumes the selected route for the Project and the selected routes for the TransWest Express and the Gateway West (in Wyoming) transmission projects would be colocated in the same corridor. Construction of the Project may follow and temporally overlap with construction and stabilization efforts of the TransWest Express Transmission Project and the Gateway West Transmission Project in Wyoming. Overlapping construction and stabilization periods for the projects could result in temporal effects that could prolong displacement and disturbance of migratory birds; cause a greater total area of localized temporary habitat loss prior to reclamation; and by increasing the corridor width, amplify any potential effects of habitat fragmentation. Cumulative effects of the Project and the TransWest Express and the Gateway West transmission projects are discussed qualitatively.

Synergistic effects also include a potential increase in collision risk where these transmission lines would be constructed in the same corridor. However, there also are technical considerations for the location of multiple transmission lines across the landscape (APLIC 2012). Colocating the Project and TransWest Express Transmission Project, or any other parallel transmission lines, within a distance of 1,500 feet may require birds to make repeated flight adjustments and could increase collision risk compared to a single transmission line. Collision risk could be reduced in sensitive areas, such as known migratory or flight paths, by siting the two transmission lines directly adjacent to one another (within 250 feet). Potential collisions with wires located at different heights are unlikely to occur as similar clearance standards would be required for both the Project and TransWest Express transmission lines, which carry similar voltages.

4.3.10 Fish and Aquatic Resources

The general approach for analysis of cumulative effects on aquatic habitats, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on direct and indirect impacts from the Project detailed in Section 3.2.10 and are considered in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

Special status fish and aquatic species known for occurring within 1 mile of the reference centerlines, critical habitats for federally listed special status fish and aquatic species occurring within 1 mile of the reference centerlines, and general fish and aquatic habitats occurring within 300 feet of the reference centerlines are identified and quantitatively analyzed in Section 3.2.10.5.

Given that water quality and aquatic habitats are highly interrelated, this section is supported by the quantitative assessment of impacts on surface-water quality, detailed in Section 4.3.4.3. The water resources cumulative effects analysis uses the ground disturbance model described in Section 2.5.1.2 and the quantitative direct and indirect impacts of the Project in conjunction with other past and present actions and RFFAs in a particular subbasin on the water resources identified in Section 3.2.4.3.2 with a particular focus on how those actions would affect surface-water quality. Results of that analysis serve as supporting information for the qualitative discussion of indirect impacts on fish and aquatic resources, which are described in the following sections.

In addition to using the results of the water-resources quantitative analysis, this qualitative analysis of fish and aquatic resources will take into account the effects of the Project and other past and present actions and RFFAs in subbasins particularly sensitive to ground-disturbing activities. These watersheds include areas with high erosion potential (refer to Section 3.2.2), impaired or outstanding waters (refer to Section 3.2.4), and areas known to support special status species and general aquatic habitats (refer to Section 3.2.10).

4.3.10.1 Issues Identified for Analysis

Issues related to the effects of the Project and other past and present actions and RFFAs on fish and aquatic resources analyzed in this section were identified by the public and the Agency Interdisciplinary Team during scoping. Analysis was conducted using the best available data for fish and aquatic resources.

4.3.10.1.1 Potential Impacts on Federally Listed Endangered Fish and Designated Critical Habitats

Habitat quality is the primary limiting factor of any fish or aquatic species population and can be tied directly to recruitment and fecundity, as well as short- and long-term survivability. Federally listed species are particularly prone to disturbance, which can result in alterations and degradation of habitat quality. The *Determination of Critical Habitat for Colorado River Fishes* (FWS 1994b) cites that “large-scale development and introduction of nonnative species” are the leading causal factors leading up to the 1994 listing and subsequent designation of critical habitat for the four native Colorado River fishes.

4.3.10.1.2 Potential Impacts on BLM, USFS, and State-listed Special Status Fish and Aquatic Species

Modification of habitat components, on which regionally rare or justifiably sensitive fish and aquatic species are dependent, can result in direct and indirect impacts on populations on the local level and/or across a species’ known range. Similar to species listed under the ESA; BLM, USFS, and state-listed special status species are highly prone to adverse impacts from project related disturbance resulting in habitat alteration.

4.3.10.1.3 Potential Impacts on Aquatic Habitats Supporting Fish, Amphibians, and Other Aquatic Organisms

Modification of aquatic habitats supporting fish, amphibians, and other aquatic organisms can result from direct and indirect impacts, including ground disturbance, water draw down, and direct take from recreation.

4.3.10.2 Existing Condition

Residential, agricultural, and infrastructure development has influenced natural aquatic habitats throughout the CIAA. Development and expansion of residential areas can have an effect on fish and aquatic resources mainly due to an increase in the number of people living in a given area. As populations grow, the need for and consumption of water in municipal areas increases. To accommodate the public's need for water, facilities have been constructed that affect the natural condition of aquatic habitats. These facilities range from water storage structures, modification of stream channels for flood control, sourcing and treatment of stream-born water for municipal use, and post-treatment of effluent that is then discharged into waterbodies. These modifications can result in both beneficial and adverse short- and long-term effects on fish and aquatic resources.

Agricultural practices in the Project area also have an effect on fish and aquatic resources. Two contributing factors that resulted in modification to natural aquatic habitats include the construction of water impoundments and the contribution of sediment and nutrients into aquatic habitats. Construction of impoundments has been a standard practice for centuries, allowing farmers and ranchers to produce crops and livestock in areas that would not be conducive for agriculture without water storage facilities. This has resulted in many natural lotic habitats being dammed, creating lentic habitats that support a far greater range of fish species while at the same time limiting habitat available for native species dependent on lotic habitats. This cause-and-effect scenario has resulted in both adverse and beneficial impacts on fish and aquatic resources through modification of natural habitats.

Agricultural practices are also responsible for the degradation of aquatic habitats through the nonpoint and point discharge of nutrient and sediment-rich effluent. These adverse effects result from the application of herbicides, pesticides, and fertilizers to fields that are transported to aquatic habitats as irrigation water is returned to canals, rivers, reservoirs, etc. Another nonpoint source of effluent is generated from dairies or areas heavily used for grazing livestock. Effluent mostly consists of sediment and nutrients that if uncontrolled can overload aquatic systems, modifying the abiotic and biotic processes necessary to maintain natural functioning aquatic conditions.

In addition to agricultural practices, wildfires and vegetation management practices that modify riparian and wetland habitats can affect aquatic habitats by decreasing soil stability, inhibiting the ability to moderate heavy flows, and removing shade. Modification of this nature results in higher water temperatures, decreased oxygen potential, and embeddedness of the substrate, which reduces breeding habitat that many species rely on for reproduction. The subsequent outcome of these results can include a shift in fish and aquatic species inhabiting aquatic habitats, changes in water temperature and chemistry, and potential introduction of invasive species due to changes in riparian and wetland functionality, flow dynamics, water quality, and habitat availability. Fish and aquatic resources affected by wildfires and vegetation management were excluded from the quantitative analysis as aquatic communities can recover from these events. Recovery from wildfires depends on the time since the occurrence, precipitation amounts, vegetation community type, fire intensity, and degree of associated degradation (weed invasion, soil loss, soil hydrophobicity, and alteration of riparian community structure).

Development of infrastructure can result in indirect and direct effects on fish and aquatic resources. The main contributing factor affecting fish and aquatic resources resulting from the development of infrastructure can be linked to ground disturbance that generates erosion and subsequent sedimentation to receiving waters. For the most part, projects are designed to protect water resources and aquatic habitats. There are, however, indirect impacts that cannot be planned for such as accidental, project-related discharge of sediment as well as other environmentally harmful materials that can result in detrimental or adverse effects on fish and aquatic resources, namely through the degradation of water quality.

The introduction of game fish, non-native invasive fish, non-native invasive plants, and other aquatic organisms also can lead to adverse, sometimes irreversible, effects on fish and aquatic resources. Introduction of these organisms can limit the space and resources that endemic aquatic species depend on, resulting in competition for habitat and limiting available resources for species with a narrow habitat niche.

4.3.10.3 Results

4.3.10.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Results of the cumulative effects analysis on aquatic habitats in the WYCO alternative routes are summarized in Section 4.3.4.3.1, Tables 4-37 and 4-38.

Aquatic habitats in the CIAA for the WYCO alternative routes are distributed throughout nine subbasins (refer to Section 3.2.4) and include between 184,552 and 236,067 acres (refer to Tables 4-37 and 4-38 in Section 4.3.4.3.1) of aquatic habitats associated with surface water resources and between 194,291 and 209,399 acres of aquatic habitats associated with wetland-riparian water resources, depending on the alternative route. Major perennial aquatic habitats in the area (detailed in Section 3.2.4.4) include, but are not limited to, the Medicine Bow, Upper North Platte, Little Snake, and White rivers as well as Muddy Creek.

Ground-disturbing activities associated with past and present activities in the CIAA for the WYCO alternative routes that may currently be affecting aquatic habitats include:

- coal mines
- noncoal mines, including the Sweetwater and Terry Hankins mines
- oil and gas development
- oil shale and tar sands development
- pipelines, including the Enterprise Mid-America and Western Expansion II pipelines
- residential developments
- renewable energy facilities

Past and present development has contributed to some level of ground disturbance that, over time, is expected to be reclaimed in compliance with federal and state reclamation requirements. However, long-term impacts could result in removal or modification of riparian and wetland habitats and destabilization of soils in the watersheds feeding Muddy Creek and the Little Snake River in the BLM Rawlins and Little Snake Field Offices where fragile soils are highly prone to erosion. Refer to Section 3.2.2 for a description and location of naturally erodible or otherwise fragile soils for the WYCO alternative routes. Where past and present development are not meeting reclamation requirements, some adverse effects could be impacting aquatic habitats on riparian, wetland, and/or aquatic habitats as well as increased sediment loading and water turbidity in the intermittent and perennial habitats close to the CIAA for the WYCO alternative routes.

In addition to the effects of past and present actions, fish and aquatic resources in the CIAA in association with the WYCO alternative routes have been affected by wildfires and vegetation management actions. The fish and aquatic resources affected by wildfires in the CIAA for the WYCO routes occur mostly in

Moffat County, Colorado, with the greatest concentration of wildfires associated with the CIAA for Alternative WYCO-D. Fish and aquatic resources affected by vegetation management actions, including prescribed burns, occur mostly in Carbon County, Wyoming, in association with Alternative WYCO-D. The Mud Springs (2007), Bitter Brush (2006), Lone Tree (2007), and Winter Valley (2000) fires as well as prescribed burns and other vegetation management treatments conducted by the BLM Rawlins and Little Snake Field Offices account for most of the effect on fish and aquatic resources resulting from wildfires or vegetation management actions. As recovery from disturbance events depends on the time since the occurrence, precipitation amounts, vegetation community type, disturbance intensity, and degree of associated degradation, it is difficult to determine the degree of localized recovery relative to each of the listed events. However, due to the amount of time that has elapsed since many of the listed events, fish and aquatic resources and their affected habitats in the CIAA as a whole are likely in various stages of recovery.

The Gateway West Transmission Project is a present action in the CIAA for the WYCO alternative routes.

RFFAs in the CIAA for the WYCO alternative routes include:

- the Rosebud coal mine
- Continental Divide-Creston Junction and Kerr-McGee oil and gas projects
- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project

Ground disturbance from implementation of RFFAs, including the Project, would be expected to result in localized short-term, indirect adverse effects on fish and aquatic resources, namely through modification of habitats in the CIAA. Short-term impacts could include destabilization of sensitive or otherwise fragile soils and modification of upland, riparian, and wetland habitats potentially supporting amphibians and other aquatic or semi-aquatic species. These direct impacts on soils and vegetation could result indirectly in short-term elevated sediment loading in surface waters, increased water temperature, and decreased habitat availability; degrading the quality and availability of those habitats. However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would be required for RFFAs authorized and implemented on BLM-administered land, state land, and waters of the U.S. Following reclamation of project disturbance, adverse impacts on aquatic habitats would be mostly or completely mitigated, resulting in normalized levels of sediment loading and water turbidity and revegetation of disturbed habitats.

The Upper Platte River lies in the CIAA for the WYCO alternative routes. During Agency Interdisciplinary Team meetings for this Project, the issue of potential Project and cumulative effects on Lower Platte River endangered fish species was raised as a potential concern. There is the potential that the Project and other past and present actions and RFFAs could affect designated critical habitat for the Platte River endangered fishes. A determination of effect will be detailed in the Project Biological Assessment.

In terms of aquatic habitats associated with surface water resources, the incremental effect of Project development estimated for the WYCO alternative routes differ marginally between alternative routes. The incremental Project development would account for approximately 11 to 26 acres (0.07 to 0.1 percent) of the total estimated cumulative effect on aquatic habitats associated with surface water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on 13,956 to 20,817 acres (8 to 9 percent) of the total available aquatic habitats associated with surface water resources in the CIAA (refer to Tables 4-37 and 4-38 in Section 4.3.4.3.1). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

In terms of aquatic habitats associated with wetland-riparian water resources, the incremental effect of Project development estimated for the WYCO alternative routes differ marginally between alternative routes. The incremental Project development would account for approximately 35 to 46 acres (0.07 to 0.09 percent) of the total estimated cumulative effect on aquatic habitats associated with wetland-riparian water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on 45,232 to 48,845 acres (23 percent) of the total available aquatic habitats associated with wetland-riparian water resources in the CIAA (refer to Tables 4-37 and 4-38 in Section 4.3.4.3.1). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

4.3.10.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Results of the cumulative effects analysis on aquatic habitats in the COUT BAX alternative routes are summarized in Section 4.3.4.3.2, Tables 4-39 and 4-40.

Aquatic habitats in the CIAA for the COUT BAX alternative routes are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 206,691 and 223,389 acres of aquatic habitats associated with surface water resources and between 84,804 and 99,087 acres of aquatic habitats associated with wetland-riparian water resources, depending on the alternative route (refer to Tables 4-39 and 4-40, Section 4.3.4.3.2). Major perennial aquatic habitats in the area (detailed in Section 3.2.4) include, but are not limited to, the Green, White, and San Pitch rivers as well as Currant, Huntington, Douglas, Salt, and West creeks.

Ground disturbance associated with past and present activities in the CIAA for the COUT BAX alternative routes, which likely are affecting aquatic habitats, include:

- coal mines
- noncoal mines
- oil and gas developments
- oil shale and tar sands development
- pipelines, including the Enterprise Mid-America and Western Expansion II projects
- Clear Creek residential development

Past and present development has resulted in some level of ground disturbance and/or alteration of upland, riparian, wetland, and aquatic habitats which could be contributing adverse impacts on fish and aquatic resources in the CIAA of the COUT BAX alternative routes. Where past and present projects are in proximity to aquatic habitats, there is the potential that ground disturbance has resulted in the removal of existing riparian and/or wetland vegetation especially in the Utah portion of the COUT BAX alternative routes. Removal of riparian and wetland vegetation limits available habitat for semi-aquatic species that utilize terrestrial habitats for a portion of their life cycle (i.e., breeding, overwinter, etc.). Additionally, modification or removal of riparian or wetland vegetation can indirectly result in adverse impacts on water quality, including increased sediment loads, increase water temperature, and changes in water chemistry.

In addition to the effects of past and present actions, fish and aquatic resources in the CIAA in association with the COUT BAX alternative routes have been affected by wildfires and vegetation management actions. The fish and aquatic resources affected by wildfires and vegetation management occur mostly along the Wasatch Plateau and occur in comparatively equal concentrations relative to each COUT BAX alternative route. The Seeley (2012), Wood Hollow (2012), and Salt Creek (2007) fires as well as USFS timber sales and fuel treatments conducted by Manti-La Sal National Forest account for most of the effect to fish and aquatic resources associated with the COUT BAX alternative routes. As recovery from disturbance events depends on the time since the occurrence, precipitation amounts, vegetation community type, disturbance intensity, and degree of associated degradation, it is difficult to determine the degree of localized recovery relative to each of the listed events. However, due to the amount of time that has elapsed since many of the listed events, fish and aquatic resources and their affected habitats in the CIAA as a whole are likely in various stages of recovery.

Ground disturbance is expected to be reclaimed in compliance with federal and state reclamation requirements, which will mitigate adverse impacts. Beneficial effects of other past and present projects also could be affecting habitats utilized by fish and/or semi-aquatic species. Such effects would be attributed to habitat improvement projects where management of upland, riparian, wetland, and aquatic habitats could directly and indirectly improve habitat quality for those species.

Designated critical habitat for federally listed endangered Colorado River fishes is present in the CIAA for the COUT BAX alternative routes. Past and present projects may have resulted in some short-term disturbance of upland habitats and potentially riparian and wetland habitats adjacent to the Green, White, and Yampa rivers. Those projects may have resulted in minor ground disturbance adjacent to critical habitats but because of the endangered status of those species, any incremental impacts from past and present projects since 1994 would have required Section 7 Consultation with the FWS and appropriate selective mitigation measures would have been identified to protect those species and their habitats. Long-term adverse impacts likely are not affecting the endangered Colorado River fishes from past and present projects.

RFFAs in the CIAA for the COUT BAX alternative routes with assumed or implied ground disturbance would include the proposed Project, the Flat Canyon Coal tracts, the Narrows East Bench Diversion Dam and associated pipelines, proposed oil and gas developments, the TransWest Express transmission line, the Narrows Tunnel project, and the Shalom Electric Boulger timber salvage project.

Ground disturbance from implementation of RFFAs, including the Project, would be expected to result in localized short-term, adverse cumulative effects on aquatic habitats in the CIAA. Short-term impacts could be attributed to ground-disturbing activities in proximity to aquatic habitats, including designated critical habitat along the Green, Yampa, and White rivers as well as lentic and lotic habitats with a high probability of supporting BLM, USFS, and state-listed sensitive species. Impacts on upland, riparian, wetland, and aquatic habitats supporting fish and aquatic resources would result from project-generated destabilization or compaction of soils and/or removal of upland, riparian, and wetland vegetation.

Modification of soils and vegetation in proximity to aquatic habitats could result in short-term indirect adverse impacts on water quality by increasing the risk and severity of erosion-caused sedimentation of waters or discharges into adjacent riparian and wetland areas. Increased water turbidity in the Green, White, and Yampa rivers is not expected to result in long-term adverse effects on federally listed endangered species, namely because application of erosion-control design features of the Proposed Action are expected to fully mitigate any potential discharge. Additionally, these rivers are known to convey large sediment loads, and the fish inhabiting those habitats are accustomed to highly turbid waters. It is unlikely that, in the event erosion-control design features of the Proposed Action were to fail, the minor amount of sediment that would reach these habitats would have any measureable effect.

Areas with steep slopes in proximity to aquatic habitats raises the potential that ground disturbance resulting from the Project as well as past and present actions and RFFAs would discharge greater than normal volumes of sediment into aquatic habitats. Aquatic habitats in the COUT BAX alternative routes support federally listed endangered fish and/or BLM, USFS, and/or state-listed special status fish as well as other aquatic species such as amphibians and macroinvertebrates. Increased sediment loads reduce habitat quality and prove detrimental to fish and aquatic resources. Additional information regarding areas of fragile or otherwise highly erodible soils prone to erosion is provided in Section 4.3.2.

In terms of aquatic habitats associated with surface water resources, the incremental effect of Project development estimated for the COUT BAX alternative routes differ marginally between alternative routes. The incremental Project development would account for approximately 47 to 57 acres (0.2 to 0.3 percent) of the total estimated cumulative effect on aquatic habitats associated with surface water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on 16,447 to 19,057 acres (8 to 9 percent) of the total available aquatic habitats associated with surface water resources in the CIAA (refer to Tables 4-39 and 4-40, Section 4.3.4.3.2). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

In terms of aquatic habitats associated with wetland-riparian water resources, the incremental effect of Project development estimated for the COUT BAX alternative routes differ marginally between alternative routes. The incremental Project development would account for approximately 15 to 17 acres (0.07 percent) of the total estimated cumulative effect on aquatic habitats associated with wetland-riparian water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on 20,985 to 25,768 acres (25 to 26 percent) of the total available aquatic habitats associated with wetland-riparian water resources in the CIAA (refer to Tables 4-39 and 4-40, Section 4.3.4.3.2). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

4.3.10.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Results of the cumulative effects analysis on aquatic habitats in the COUT alternative routes are summarized in Section 4.3.4.3.3, Tables 4-41 and 4-42.

Aquatic habitats in the CIAA for the COUT alternative routes are distributed throughout nine subbasins (refer to Section 3.2.4) and range between 203,932 and 222,720 acres of aquatic habitats associated with surface water resources and between 167,437 and 195,635 acres of aquatic habitats associated with wetland-riparian water resources, depending on the alternative route (refer to Tables 4-41 and 4-42, Section 4.3.4.3.3). Many perennial systems occur in the CIAA and include but are not limited to the Duchesne, Green, Lake Fork, Price, Strawberry, Uinta, and White rivers as well as Argyle, Hop, Indian, Red, Salt, Soldier, Sowers, Thistle, Tie Fork, and Willow creeks.

Ground disturbance associated with past and present activities in the CIAA for the COUT alternative routes that currently may be affecting aquatic habitats include:

- active coal mines
- Central Utah Telephone Fiber Optic communication lines
- lower Duchesne River Wetlands Project
- noncoal mine leases on SITLA lands
- oil and gas development on BLM-administered land, SITLA-administered land, and private holdings
- oil shale and tar sands projects
- pipelines, including the Roosevelt, Enterprise Mid-America, Western Expansion II and the Magnum Gas Storage projects

- Carbon County proposed ATV trail
- residential developments

Impacts of past and present projects in the COUT alternative routes on endangered Colorado River fishes and critical habitats are expected to be the same as those discussed for the COUT BAX alternative routes.

In addition to the effects of past and present actions, fish and aquatic resources in the CIAA in association with the COUT alternative routes have been affected by wildfires and vegetation management actions. The fish and aquatic resources potentially affected by wildfires occur mostly along the Wasatch Plateau and occur in comparatively equal concentrations relative to each COUT alternative route. The Seeley (2012), Wood Hollow (2012), Salt Creek (2007), Church Camp (2012) and Mellen (2009) fires account for the most notable wildfire events associated with the COUT alternative routes. Fish and aquatic resources potentially affected by vegetation management actions also occur mostly along the Wasatch Plateau and secondarily occur in association with lands administered by the BLM Vernal Field Office. Vegetation management actions occur in comparatively equal concentrations relative to each COUT alternative route. USFS timber sales and fuel treatments conducted by Manti-La Sal National Forest as well as habitat projects conducted by the BLM Vernal Field Office account for most of the effect on fish and aquatic resources associated with vegetation management actions. As recovery from disturbance events depends on the time since the occurrence, precipitation amounts, vegetation community type, disturbance intensity, and degree of associated degradation, it is difficult to determine the degree of localized recovery relative to each of the listed events. However, due to the amount of time that has elapsed since many of the listed events, fish and aquatic resources and their affected habitats within the CIAA as a whole are likely in various stages of recovery.

RFFAs in the CIAA for the COUT alternative routes with assumed or implied ground disturbance would include:

- Flat Canyon and Long Canyon coal mine leases
- Narrows Reservoir, East Bench diversion dam, Narrows tunnel, and associated Upper Cottonwood and Oak Creek pipelines
- Price industrial complex
- oil and gas development from the Kerr-McGee and Monument Butte projects
- Woodside power-generation facility
- Narrows highway relocation project
- Shalom Electric Boulger timber salvage project
- TransWest Express Transmission Project

Impacts on federal and state-listed special status species, designated critical habitats, and other aquatic and semi-aquatic habitats resulting from implementation of RFFAs in the COUT alternative routes are expected to be the same as those described under the COUT BAX alternative routes.

In terms of aquatic habitats associated with surface water resources, the incremental effect of Project development estimated for the COUT alternative routes differ marginally between alternative routes. The incremental Project development would account for approximately 17 to 36 acres (.1 to 0.2 percent) of the total estimated cumulative effect on aquatic habitats associated with surface water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on 12,938 to 17,739 acres (6 to 8 percent)of the total available aquatic habitats associated with surface water resources in the CIAA (refer to Tables 4-41 and 4-42, 4.3.4.3.3). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

In terms of aquatic habitats associated with wetland-riparian water resources, the incremental effect of Project development estimated for the COUT alternative routes differ marginally between alternative routes. The incremental Project development would account for approximately 7 to 66 acres (0.01 to 0.1 percent) of the total estimated cumulative effect on aquatic habitats associated with wetland-riparian water resources in the CIAA. Development of the Project when added to the past and present actions and RFFAs could result in potential cumulative effects on 52,201 to 57,239 acres (29 percent) of the total available aquatic habitats associated with wetland-riparian water resources in the CIAA (refer to Tables 4-41 and 4-42, in Section 4.3.4.3.1). However, implementation of design features of the Proposed Action and selective mitigation measures, including reclamation of disturbed areas, would minimize cumulative impacts on fish and aquatic resources as well as the aquatic habitats on which they rely.

4.3.11 Land Use

The approach for analysis of cumulative effects on land-use resources (existing and future land uses), including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.11) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

The incremental effects of the Project cumulatively with other projects on existing land use are discussed cumulatively based on data for the current condition, the existing past and present actions, and RFFAs.

Existing land-use cumulative effects are included in the following discussions. For future land use, a list of the projects by alternative route is presented, but no cumulative effects analysis was completed for this resource.

4.3.11.1 Issues Identified for Analysis

4.3.11.1.1 Potential Impacts on Existing Land Uses or Land-management Objectives

Potential conflicts could include a variety of current and proposed land uses (e.g., agriculture, residential and industrial); these are discussed individually in this section. The conflicts would be more intense where the Project and other future and/or existing actions are occurring or planned to occur in the same geographic extent as various land-use resources. These impacts would be intensified where existing actions have conflicted already with the uses that may have occurred in the past or where an RFFA is proposed in the same area as the Project.

Whether the Project is compounding impacts on an existing use or RFFAs, the cumulative effect on agricultural uses, for instance, may result in the need for relocation of operations or existing facilities related to agriculture. In addition, the Project may possibly require agricultural uses or related infrastructure to shift, in the short-term and long-term.

Land-use management objectives may require formal amendments or other provisions relevant to existing grazing allotments, state-managed leases, and in municipalities—commercial, industrial, and residential uses.

4.3.11.1.2 Potential Impacts on Existing and Future Land Uses

Potential impacts include crossing commercial, residential, or agriculture uses; three examples of areas that may not be compatible with future utility projects. These impacts would be intensified where other existing actions have already affected the land uses or an RFFA is proposed in the same area.

Whether the Project is directly or indirectly affecting an existing use or RFFAs, the cumulative effect on existing and future land uses may result in the overall land use changing or being modified based on all types of impacts and effects.

4.3.11.2 Existing Condition

4.1.1.1.2 Existing and Future Land Use

The predominant existing land uses in the Project area include grazing, rangeland, and agriculture. These land uses, as well as commercial, industrial, public/quasi-public, school and educational, residential and communication facility land uses, occur in the geographic scope of the Project as past and present actions. However, commercial, public/quasi-public, school and educational, and communications facilities land uses would not occur in the Project right-of-way. Thus, cumulative impacts are not discussed for these uses in the results below. The future land uses and types of past and present projects occurring in the geographic scope include those listed for existing land use, as well as planned residential subdivisions, oil and gas exploration and production, mining, and the TransWest Express Transmission Project.

No separate analysis for cumulative effects was conducted for future land use because the projects are considered as RFFAs, and all resource types use these RFFAs as part of the cumulative effects analysis.

4.3.11.3 Results

The following sections discuss the results of cumulative effects analysis on existing land use for all alternative routes. Existing land uses are reported by use in Tables 4-113 to 4-119. The existing land use CIAA varies slightly from other resources analyzed for this Project. As discussed in Section 4.2, a combination of the existing land use inventory (Section 3.2.11.4.1), buffered transmission lines, pipelines, railroads, and roads were used to determine the spatial extent of existing development for all resources. To analyze the cumulative impacts for existing land use as an individual resource, the existing development layer was modified by extracting grazing/rangeland, agriculture, industrial, residential, and utilities from the existing inventory. Pipelines and transmission lines are used to determine the cumulative impacts on the five existing land uses discussed above but are not reported as part of the existing land use inventory. Roads are discussed qualitatively in Section 4.3.13. Individual roadway names are not discussed due to the volume of roads in the geographic scope for transportation and access.

For each land-use resource discussed, a percentage of Project impact is provided if applicable. This percentage was calculated using the acreage of Project disturbance, divided by the total available resource acreage, resulting in the percentage of Project impact, as listed in the tables in each section below.

As discussed previously, no analysis was conducted for future land use as these projects are being used in the analysis as the reasonably foreseeable future projects. For the future land use results section, refer to Table 4-3 with the list of the RFFAs by alternative route.

4.3.11.3.1 Existing Land Use Effects

The following sections summarize the cumulative effects on existing and future land use that would be crossed by all Project alternative routes. A qualitative discussion follows each summary table. Each table lists by alternative route the total available resource, the development in acres (Project, past and present actions, and RFFAs), the total amount of development, the percentage of Project impact, and the remaining resource. All results are displayed in acres and in some cases, in percentages. Percentages were calculated by dividing the acres of Project disturbance by the total available resource acres.

The qualitative discussion for each existing land use is summarized for the WYCO, COUT BAX, and COUT alternative routes. The discussion includes the past and present actions and/or RFFAs that have occurred, or could occur, in the boundary of these existing land uses, in addition to the Project.

Grazing/Rangeland

The cumulative effects summary for existing land use (grazing/rangeland) by land-use jurisdiction is presented in Tables 4-113 to 4-115.

TABLE 4-113
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (BUREAU OF LAND MANAGEMENT GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
WYCO-B (Agency and Applicant Preferred Alternative)	1,538,577	52,817	29,872	2,956	85,646	1,452,931	<1
WYCO-C	1,599,385	52,335	31,672	2,891	86,898	1,512,487	<1
WYCO-D	1,233,361	52,300	25,887	2,845	81,031	1,152,330	<1
WYCO-F	1,563,556	54,330	32,651	2,994	89,975	1,473,582	<1
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	1,386,521	52,309	6,614	2,730	61,654	1,324,868	<1
COUT BAX-C	1,515,640	58,515	51,448	2,348	112,311	1,403,329	<1
COUT BAX-E	1,508,845	60,701	31,140	2,721	94,563	1,414,282	<1
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
COUT-A	363,315	28,676	2,700	1,097	32,473	330,841	<1
COUT-B	401,955	29,685	3,663	1,071	34,420	367,535	<1
COUT-C (Agency and Applicant Preferred Alternative)	779,360	98,831	5,816	1,997	106,644	672,715	<1
COUT-H	866,678	107,339	6,028	1,704	115,071	751,606	<1
COUT-I	941,286	109,666	6,607	2,301	118,574	822,712	<1

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

TABLE 4-114
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (U.S. FOREST SERVICE GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	120,625	46,337	357	193	46,887	73,738	<1
COUT BAX-C	120,625	46,337	357	192	46,886	73,739	<1
COUT BAX-E	31,366	7,543	230	46	7,819	23,547	<1
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
COUT-A	207,556	1,996	891	337	3,225	204,331	<1
COUT-B	209,878	2,778	717	152	3,647	206,231	<1
COUT-C (Agency and Applicant Preferred Alternative)	189,184	1,651	419	92	2,163	187,021	<1
COUT-H	31,366	7,543	230	50	7,823	23,543	<1
COUT-I	120,625	46,337	357	205	46,899	73,725	<1
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

TABLE 4-115
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (STATE GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
WYCO-B (Agency and Applicant Preferred Alternative)	9,245	1,648	379	189	2,216	7,029	2
WYCO-C	9,800	1,759	411	193	2,363	7,437	2
WYCO-D	18,317	2,832	367	309	3,508	14,809	2
WYCO-F	9,805	1,694	414	189	2,297	7,508	2
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	118,604	12,552	1,451	386	14,389	104,216	<1
COUT BAX-C	127,640	16,837	1,477	176	18,491	109,149	<1
COUT BAX-E	132,348	17,408	1,447	137	18,992	113,355	<1

TABLE 4-115
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (STATE GRAZING/RANGELAND) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
COUT-A	21,463	1,307	220	122	1,649	19,815	<1
COUT-B	36,469	1,555	484	127	2,166	34,302	<1
COUT-C (Agency and Applicant Preferred Alternative)	64,762	41,654	1,285	201	43,140	21,622	<1
COUT-H	59,112	41,159	244	87	41,490	17,622	<1
COUT-I	97,031	43,185	914	248	44,346	52,685	<1

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Grazing/Rangeland

The percentage of the Project alternative routes located in grazing allotments for all WYCO alternative routes would be less than 1 percent on BLM land and approximately 2 percent on state land. Various past and present actions and RFFAs would occur throughout the grazing allotments on BLM-administered and state lands. The short-term cumulative effects of the Project, in addition to the past and present actions and RFFAs, would include construction activities of projects that would require gates being added to existing fences; construction related disturbances (noise, vehicles/equipment, personnel) associated with development of access roads, site grading, and building structures; and larger footprints of disturbance before restoration activates occur. The long-term cumulative effects would be reduced grazing/rangeland available where permanent disturbance/structures footprints would occur from the projects.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Grazing/Rangeland

The percentage of the Project alternative routes located in grazing allotments for all COUT BAX alternative routes would be less than 1 percent on BLM-administered land, less than 1 percent on USFS-administered land, and less than 1 percent on state land. Various past and present actions and RFFAs would occur throughout the grazing allotments on BLM- and USFS-administered and state lands. The short- and long-term cumulative effects would be similar to those discussed for the WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Grazing/Rangeland

The percentage of the Project alternative routes located in grazing allotments for all COUT alternative routes would be less than 1 percent on BLM-administered land, less than 1 percent on USFS-administered land, and less than 1 percent on state land. Various past and present actions and RFFAs would occur throughout the grazing allotments on BLM- and USFS-administered and state lands. The short- and long-term cumulative effects would be similar to those discussed for the WYCO alternative routes.

Agriculture

The cumulative effects summary for existing land use (agriculture) is presented in Table 4-116.

TABLE 4-116
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (AGRICULTURE) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
WYCO-B (Agency and Applicant Preferred Alternative)	648	11	2	0	13	635	0
WYCO-C	645	11	2	0	13	631	0
WYCO-D	17,905	388	284	84	756	17,149	<1
WYCO-F	645	11	2	0	13	632	0
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	5,735	156	80	50	286	5,449	<1
COUT BAX-C	5,735	156	80	49	286	5,449	<1
COUT BAX-E	6,268	137	49	57	242	6,026	<1
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
COUT-A	12,781	1,441	138	105	1,684	11,097	<1
COUT-B	11,362	861	150	82	1,093	10,270	<1
COUT-C (Agency and Applicant Preferred Alternative)	6,624	102	51	82	235	6,389	1
COUT-H	6,714	94	76	61	231	6,483	<1
COUT-I	11,659	198	116	102	416	11,244	<1

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Agriculture

The percentage of the Project alternative routes located in agriculture areas would be less than 1 percent for WYCO alternative routes. Past and present actions occurring in agricultural areas include:

- Anadarko Atlantic Rim oil and gas development
- BLM oil and gas units for the Little Snake and White River Field Offices
- Colorado state land oil and gas leases
- Wyoming state land oil and gas leases
- Chokecherry Wind Farm Expansion
- Gateway West Transmission Project
- 16-inch and 12-inch diameter pipeline owned by El Paso Corporation
- 20-inch diameter pipeline owned by General Electric Company
- 8-inch diameter pipeline owned by Kinder Morgan Incorporated
- 6-inch diameter pipeline owned by MidAmerican Energy Holdings Corporation

- 10-inch and 6-inch diameter pipelines owned by Plains All American GP LLC
- 8-inch diameter pipeline owned by Questar Corporation
- 6-inch diameter pipeline owned by Source Gas LLC
- 6-inch diameter pipeline owned by Xcel Energy Incorporated
- Hayden to Artesia 138kV transmission line
- Craig to Rifle 230kV transmission line
- Hayden to Craig 230kV transmission line
- Bears Ears to Bonanza 345kV transmission line
- Craig to Ault 345kV transmission line
- Craig to Rifle 345kV transmission line
- D&RGW Railroad
- Secondary roads

RFFAs proposed or planned in agricultural areas include:

- TransWest Express Transmission Project
- Continental Divide-Creston Junction oil and/or gas project
- Hogback Ridge (Whirlwind I) Wind Energy Project

The short-term cumulative effects of the Project, in addition to the past and present actions and RFFAs could potentially limit access to fields or agriculture operations during construction of the projects. The long-term cumulative effects would be utility and industrial infrastructure that potentially could reduce the amount of and/or alter agriculture production lands.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Agriculture

The percentage of the Project located in agriculture areas would be less than 1 percent for all COUT BAX alternative routes. Past and present actions occurring in agricultural areas include:

- BLM oil and/or gas units for the Moab, Vernal and White River Field Offices
- Anadarko Petroleum Corporation Ferron natural gas project
- SITLA-administered active oil and gas leases
- historic fire perimeters (2000 to 2011, and 2012)
- Hiawatha Complex coalmine
- Narrows reservoir and east bench and oak creek pipelines
- Clouse No. 1 Exemption Plat and Simple Land Division
- 20-inch and 6-inch diameter pipelines owned by Questar Corporation
- 10-inch diameter pipeline owned by The Williams Companies Incorporated
- Nebo to Martian Marietta 138kV transmission line
- Rangely to Meeker 138kV transmission line
- Huntington to Emery 345kV transmission line
- Huntington to Pinto 345kV transmission line
- Mona to Bonanza 345kV transmission line
- Mona to Huntington 345kV transmission line
- Spanish Fork to Emery 345kV transmission line
- D&RGW Railroad
- Union Pacific Railroad
- Secondary roads
- Historic wild fires

RFFAs proposed or planned in agricultural areas include:

- TransWest Express Transmission Project
- Woodside power-generation facility

The short- and long-term cumulative effects would be similar to those discussed for the WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes

Agriculture

The percentage of the Project located in agriculture areas would be less than 1 percent for all COUT alternative routes. Past and present actions occurring in agricultural areas include:

- BLM habitat projects for the Vernal Field Office
- oil and gas units for the BLM Vernal Field Office
- Atlantic Rim oil and gas field
- Bill Barrett Corporation Blacktail Ridge EDA oil and/or gas development
- Greater Deadman Bench oil and gas
- Newfield Gusher Development oil and/or gas development
- SITLA-administered active oil and gas leases
- Anadarko Petroleum Corporation Ferron natural gas project
- UDOGM oil well pads
- historic fire perimeters (2000 to 2011, and 2012)
- Central Utah Telephone fiber optic line
- Roosevelt pipeline
- Victory Pipeline
- Narrows reservoir and East Bench and Oak Creek pipelines
- Residential developments in Duchesne County
- 10-inch diameter pipeline owned by Chevron Pipeline Company
- 18-inch, 12-inch, and 8-inch diameter pipelines owned by Questar Pipeline Company
- Nebo to Martin Marietta 138kV transmission line
- Mona to Bonanza 345kV transmission line
- Mona to Huntington 345kV transmission line
- Upalco to Panther 138kV transmission line
- Mounds SW PK to Helper 138kV transmission line
- D&RGW Railroad
- Union Pacific Railroad
- Secondary roads

One RFFA is proposed or planned in agricultural areas, the TransWest Express Transmission Project. The short- and long-term cumulative effects would be similar to those discussed for the WYCO alternative routes.

Industrial

The cumulative effects summary for existing land use (industrial) is presented in Table 4-117.

TABLE 4-117
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (INDUSTRIAL) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
WYCO-B (Agency and Applicant Preferred Alternative)	1,477	30	87	0	117	1,360	0
WYCO-C	1,160	51	82	1	134	1,026	<1
WYCO-D	1,280	37	47	9	93	1,187	<1
WYCO-F	1,438	22	93	0	115	1,322	0
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	1,130	144	22	4	169	962	<1
COUT BAX-C	1,087	103	22	3	128	959	<1
COUT BAX-E	952	137	48	0	185	767	0
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
COUT-A	1,106	166	7	6	179	927	<1
COUT-B	1,665	90	26	2	119	1,547	<1
COUT-C (Agency and Applicant Preferred Alternative)	1,670	455	1	1	456	1,213	<1
COUT-H	1,868	529	4	1	533	1,335	<1
COUT-I	2,230	554	3	3	559	1,672	<1
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Industrial

The percentage of the Project located in industrial areas would be less than 1 percent for the WYCO alternative routes. Past and present actions occurring in industrial areas include:

- BLM oil and gas units for the BLM White River and Little Snake Field Offices
- BLM spike treatment/vegetation management and prescribed fires for the BLM Rawlins Field Office
- Wyoming and Colorado state land oil and gas leases
- Atlantic Rim Oil and Gas development
- prescribed burns completed by the field office
- 12-inch and 8-inch diameter pipelines owned by General Electric Company
- 14-inch diameter pipeline owned by ONEOK Incorporated
- 10-inch and 6-inch diameter pipelines owned by Anadarko Petroleum Corporation
- 24-inch and 20-inch diameter pipelines owned by El Paso Corporation
- 36-inch diameter pipeline owned by Kinder Morgan Incorporation
- 10-inch and 6-inch diameter pipelines owned by Plains All American GP LLC
- 10-inch and 8-inch diameter pipelines owned by Questar Corporation
- 6-inch diameter pipeline owned by Source Gas LLC
- Sinclair to Bar X 230kV transmission line

- Hayden to Artesia 138kV transmission line
- Craig PP to Sub 2 230kV transmission line
- Craig PP to Sub 3 230kV transmission line
- Craig Sub 1 to Sub 2 230kV transmission line
- Craig PP to Craig Sub 1 345kV transmission line
- Secondary roads

The RFFAs proposed or planned in industrial areas include:

- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) wind-energy facility
- Continental Divide-Creston oil and gas development

The short-term cumulative effects of the Project in addition to the past and present actions and RFFAs could potentially limit access and/or create potential traffic conflicts with industrial uses during construction of the projects. No long-term cumulative effects are anticipated.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Industrial

The percentage of the Project located in industrial areas would be less than 1 percent for the COUT BAX alternative routes. Past and present actions occurring in industrial areas include:

- BLM oil and gas units for the BLM Grand Junction, Price, Moab, White River and Little Snake Field Offices
- Deer Creek coal lease
- historic fire perimeters (2000 to 2011, and 2012)
- Anadarko Petroleum Corporation Ferron natural gas project
- SITLA-administered leases for metalliferous mineral leases, oil and gas, potash, and sand and gravel
- UDOGM oil and/or gas development
- Star Point waste-fuel coal mine
- Whites Sands missile launch facility at Green River
- 20-inch diameter pipeline owned by El Paso Corporation
- 12-inch and 10-inch diameter pipelines owned by Enterprise Products Partners LP
- 14-inch diameter pipeline owned by Questar Corporation
- 6-inch diameter pipeline owned by Source Gas LLC
- Jerusalem to Nebo 138kV transmission line
- McFadden to Huntington Plant 138kV transmission line
- Huntington to Pinto 345kV transmission line
- Mona to Huntington 345kV transmission line
- Spanish Fork to Huntington 345kV transmission line
- Rio Grande Railroad
- Secondary roads

An RFFA proposed or planned in industrial areas include the TransWest Express Transmission Project.

The short- and long-term cumulative effects on industrial uses would be similar to those discussed for the WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes

Industrial

The percentage of the Project located in industrial areas would be less than 1 percent for the COUT alternative routes. Past and present actions occurring in industrial areas include:

- BLM oil and gas units for the BLM Price and Vernal Field Offices
- UDOGM development
- Berry Petroleum South Unit oil and/or gas development
- Anadarko Petroleum Corporation Ferron Natural Gas Project
- Bill Barrett Corporation Blacktail Ridge EDA oil and/or gas development
- EOG Resources, Inc. Chapita Wells-Stagecoach Area natural gas development
- Questar Exploration and Production Company Greater Deadman Bench
- Kerr-McGee Oil and Gas Onshore LP Greater Natural Buttes oil and/or gas development
- Newfield Gusher Development oil and/or gas development
- Encana North Chapita Wells Natural Gas Development
- XTO Energy’s Riverbend directional infill oil and/or gas project
- Gasco Energy, Inc. Uinta natural gas oil and/or gas development
- Deer Creek coal mine
- Deserado existing coal mine and mine expansion
- Intermountain Power Agency Wildcat Loadout coal mine
- SITLA leases for gilsonite, limestone, oil and gas, shale, and sand and gravel
- BLM fuel-treatment/vegetation management and habitat projects for the Vernal Field Office
- historic fire perimeters (2000 to 2011, and 2012)
- gilsonite mines
- Rye Patch oil project
- Red Leaf oil shale project
- Wildcat Loadout
- Residential Development in Duchesne County
- Victory pipeline
- 10-inch and 6-inch diameter pipelines owned by Chevron Corporation
- 20-inch, 16-inch, and 12-inch diameter pipelines owned by Questar Corporation
- 6-inch diameter pipeline owned by Anadarko Petroleum Corporation
- Bonanza to Vernal 138kV transmission line
- Jerusalem to Nebo 138kV transmission line
- Mona to Bonanza 345kV transmission line
- Mona to Huntington 345kV transmission line
- Spanish Fork to Carbon 138kV transmission line
- Upalco to Panther 138kV transmission line
- McFadden to Huntington Plant 138kV transmission line
- D&RGW Railway
- Utah Railway
- Rio Grande Railroad

An RFFA proposed or planned in industrial areas includes the TransWest Express Transmission Project.

The short- and long-term cumulative effects on industrial uses would be similar to those discussed for the WYCO alternative routes.

Residential

The cumulative effects summary for existing land use (residential) is presented in Table 4-118.

TABLE 4-118
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (RESIDENTIAL) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
WYCO-B (Agency and Applicant Preferred Alternative)	69	3	1	0	4	65	0
WYCO-C	69	3	1	0	4	65	0
WYCO-D	562	31	2	0	33	529	0
WYCO-F	69	3	1	0	4	65	0
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	739	42	0	0	42	697	0
COUT BAX-C	739	42	0	0	42	697	0
COUT BAX-E	785	53	1	0	54	731	0
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
COUT-A	1,860	464	3	1	468	1,392	<1
COUT-B	1,290	212	1	2	215	1,075	<1
COUT-C (Agency and Applicant Preferred Alternative)	619	53	1	0	54	566	0
COUT-H	860	119	1	0	120	740	0
COUT-I	655	33	1	0	34	620	0

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Residential

No cumulative effects are anticipated on residential areas.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Residential

No cumulative effects are anticipated on residential areas.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Residential

The percentage of the Project located in residential areas would be less than 1 percent for Alternative COUT-A and COUT-B. Past and present actions occurring in residential areas include:

- BLM oil and/or gas units for the BLM Vernal, Price, and Richfield Field Offices
- Central Utah Telephone fiber optic line
- Ferron natural gas project
- SITLA-administered active oil and/or gas leases, sand and gravel permits

- historic fire perimeters (2000 to 2011, and 2012)
- Roosevelt Pipeline
- Victory Pipeline
- Bill Barrett Corporation Blacktail Ridge EDA oil and/or gas development
- Bill Barrett Corporation Lake Canyon
- Residential developments in Duchesne County
- Narrows East Bench and Oak Creek pipelines
- 18-inch and 8-inch diameter pipelines owned by Questar Corporation
- Mona to Bonanza 345kV transmission line
- Spanish Fork to Carbon 138kV transmission line
- Upalco to Panther 138 kV transmission line
- Mounds SW PK to Helper 138kV transmission line
- D&RGW Railway
- Rio Grande Railroad
- Secondary roads

RFFAs, proposed or planned, in residential areas include:

- TransWest Express Transmission Project
- Strawberry Highlands – Strawberry Phase residential development

The short-term cumulative effects of the Project in addition to the past and present actions and RFFAs could potentially limit and/or alter access to existing residential developments and produce noise during construction of the projects. The long-term cumulative effects could potentially restrict use of property where projects would occur on private lands.

Utilities

The cumulative effects summary for existing land use (utilities) is presented in Table 4-119.

TABLE 4-119
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (UTILITIES) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes							
WYCO-B (Agency and Applicant Preferred Alternative)	1,733	78	1	16	95	1,639	<1
WYCO-C	1,765	78	0	16	95	1,670	<1
WYCO-D	5,281	142	1,016	59	1,217	4,064	1
WYCO-F	1,861	79	6	17	102	1,759	<1
Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes							
COUT BAX-B	110	10	7	1	17	93	<1
COUT BAX-C	112	10	7	0	17	94	0
COUT BAX-E	50	5	2	2	9	41	4

TABLE 4-119
CUMULATIVE EFFECTS SUMMARY FOR EXISTING LAND USE (UTILITIES) FOR ALL ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
		Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes							
COUT-A	65	12	0	0	12	54	0
COUT-B	115	17	2	0	19	96	0
COUT-C (Agency and Applicant Preferred Alternative)	78	41	0	0	41	37	0
COUT-H	96	42	2	2	47	49	2
COUT-I	102	40	0	0	40	62	0
NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.							

Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO) Alternative Routes Utilities

The percentage of the Project located in the land-use category of utilities would be less than 2 percent for WYCO alternative routes. Past and present actions occurring in utility areas include:

- Atlantic Rim oil and/or gas field final boundary
- Chokecherry Wind Farm Expansion
- Colorado state land and Wyoming state land oil and/or gas leases
- Gateway West Transmission Project
- Colorado state land oil and or gas leases
- Seven Mile Hill wind-energy facility
- spike treatment (vegetation management) for the BLM Rawlins Field Office
- 16-inch and 12-inch diameter pipelines owned by El Paso Corporation
- 20-inch diameter pipeline owned by General Electric Company
- 42-inch diameter pipeline owned by Kinder Morgan Incorporated
- 16-inch diameter pipeline owned by ONEOK Incorporated
- 10-inch and 6-inch diameter pipelines owned by Plains All American GP LLC
- Happy Jack to Seminoe 115kV transmission line
- Laramie to Seminoe 115kV transmission line
- Difficulty to Miners 230kV transmission line
- Sinclair to Bar X 230kV transmission line
- Miners to Medicine Bow 115kV transmission line
- Craig to Rifle 230kV transmission line
- Craig PP to Sub 2 230kV transmission line
- Craig PP to Sub 3 230kV transmission line
- Craig Sub 1 to Sub 2 230kV transmission line
- Hayden to Craig 230kV transmission line
- Miners to Foote Creek 230kV transmission line
- Miners to Sinclair 230kV transmission line
- Bears Ears to Bonanza 345kV transmission line

- Craig to Ault 345kV transmission line
- Craig to Bears Ears 345kV transmission line
- Craig to Rifle 345kV transmission line
- D&RGW Railroad
- Secondary roads

RFFAs, proposed or planned, in utility areas include:

- Continental Divide-Creston Junction oil and/or gas project
- TransWest Express Transmission Project
- Rosebud coal exploration (permit boundary)
- Hogback Ridge (Whirlwind I) Wind Energy Project

The short-term cumulative effects of the Project in addition to the past and present actions and RFFAs could include cathodic protection where existing and future pipelines may be affected not only by the Project but by other new transmission lines. No long-term cumulative effects are anticipated for utilities.

Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX) Alternative Routes Utilities

The percentage of the Project located in the land-use category of utilities would be less than 1 percent for the COUT BAX alternative routes. Past and present actions occurring in utility areas include:

The percentage of the Project located in the land-use category of utilities would range from 0 to 4 percent for the COUT BAX alternative routes. Past and present actions occurring in utility areas include:

- BLM oil and/or gas units for the BLM White River Field Office
- SITLA-administered active oil and/or gas
- Ferron natural gas project
- historic fire perimeters (2000 to 2011, and 2012)
- 6-inch diameter pipeline owned by Energy Transfer Partners LP
- 20-inch and 6-inch diameter pipelines owned by Questar Corporation
- 26-inch and 6-inch diameter pipelines owned by The Williams Companies Inc.
- 8-inch diameter pipeline owned by Xcel Energy Inc.
- Huntington to Emery 345kV transmission line
- Huntington to Pinto 345kV transmission line
- Spanish Fork to Emery 345kV transmission line
- Mounds SW OK to Helper 138kV transmission line
- Mounds SW PK to Moab 138kV transmission line
- Mounds SW PK to East Carbon 138kV transmission line
- Secondary roads

An RFFA proposed or planned in utility areas includes the TransWest Express Transmission Project.

The short- and long-term cumulative effects on utilities would be similar to those discussed for the WYCO alternative routes.

Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT) Alternative Routes Utilities

The percentage of the Project located in the land-use category of utilities would be less than 2 percent for the COUT alternative routes. Past and present actions occurring in utility areas include:

- BLM oil and/or gas units for the BLM Vernal, Price, and White River Field Offices
- fuel treatments (vegetation management) and habitat projects for the BLM Vernal Field Office
- SITLA-administered active gilsonite, oil shale, and oil and/or gas leases
- Berry Petroleum South Unit oil and/or gas development
- Bill Barrett Corporation Blacktail Ridge EDA oil and/or gas development
- Chapita Wells/Stagecoach oil and/or gas project
- Gasco Energy Inc. Uinta natural gas oil and/or gas development
- Gilsonite mining
- Greater Deadman, Lake Canyon EDA Boundary, Encana North Chapita Wells natural gas development
- XTO Energy's Riverbend directional infill oil and/or gas project
- Greater Natural Buttes Area gas development project EIS
- historic fire perimeters (2012)
- Victory pipeline
- 20-inch diameter pipeline owned by El Paso Corporation
- 20-inch, 18-inch, and 16-inch diameter pipelines owned by Questar Corporation
- 12-inch diameter pipelines owned by The Williams Companies Inco.
- 10-inch diameter pipeline owned by Chevron Corporation
- Upalco to Panther 138kV transmission line
- Upalco to Ashley 138kV transmission line
- Bonanza to Rangely 138kV transmission line
- Bonanza to Vernal 138kV transmission line
- Bears Ears to Bonanza 345kV transmission line
- Mona to Bonanza 345kV transmission line
- Carbon to Helper 138kV transmission line
- Mounds SW PK to Helper 138kV transmission line
- Spanish Fork to Carbon 138kV transmission line
- Wellington to Coal Creek SW RK 138kV transmission line
- D&RGW Railway

An RFFA proposed or planned in utility areas includes the TransWest Express Transmission Project.

The short- and long-term cumulative effects on utilities would be similar to those discussed for the WYCO alternative routes.

4.3.12 Parks, Preservation, and Recreation

The approach for analysis of cumulative effects on recreational uses and resources in parks and associated with other recreation resources, including the geographic and temporal scopes defined for analysis is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.12) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2. Potential cumulative effects on the visual resources (i.e., scenery and views) are addressed in Section 4.3.18. Also, impacts on National Trails Systems are discussed in Section 4.3.19.

4.3.12.1 Issues Identified for Analysis

4.3.12.1.1 Potential Impacts on Recreational Uses and Areas

Potential conflicts with recreational uses and areas include providing recreational users opportunities to leave the designated use area and use the right-of-way for the Project;, placement of a transmission line supporting structure in a recreation area that requires open space, such as a snow-kiting play area; and structure placement in a designated SRMA with management restrictions on utility development.

4.3.12.2 Existing Condition

In general, almost all parks, preservation, and recreation areas have been affected by development from past and present actions. However, the natural environment has been altered in a manner that allows for past and present recreation actions as well as recreational uses, such as recreational infrastructure, trails, scenic byways, etc. to occur.

4.3.12.3 Results

4.3.12.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Past and present actions and RFFAs in parks, preservation, and recreation resource areas crossed by the WYCO alternative routes are presented in Table 4-120, and the potential cumulative effects are discussed for each park, preservation, and recreation resource area below.

Effects

The following text summarizes the cumulative effects on recreational uses and resources in parks and preservation areas associated with other recreation resources crossed by a WYCO alternative route, including past and present actions and/or RFFAs in addition to the Project.

South Beach Public River Access Site

The Project would not contribute incrementally to cumulative effects on recreational uses at the South Beach Public River Access site as the Project would be located in an area of existing cumulative development for past actions. Also, because the Project would be designed to span the site, permanent infrastructure would not affect the site. Past and present actions that occur in the South Beach Public River Access site include:

- oil and/or gas leases on Colorado state land
- Hayden to Artesia 138kV transmission line
- Bears Ears to Bonanza 345kV transmission line
- Craig to Rifle 345kV transmission line
- D&RGW Railroad
- Colorado State Highway 13

One RFFA is proposed in the CIAA, the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the South Beach Public River Access site, in addition to the past and present actions and RFFAs, would include limited and/or altered access and increased noise during construction of the transmission projects. The long-term cumulative effect would include the additional transmission lines spanning the site.

TABLE 4-120
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming									
North Platte Special Recreation Management Area[1]	Bureau of Land Management (BLM) Rawlins Field Office	All WYCO	5,866	126	0	0	126	5,740	0
Outlaw Trail Loop Scenic Drive[2]	Carbon County	WYCO-B, WYCO-C, WYCO-F	3,397	984	134	2	1,120	2,278	<1
		WYCO-D	3,397	984	134	151	1,269	2,128	<1
Rawlins to Baggs Historic Road (historic trail)[2]	BLM Rawlins Field Office	WYCO-B, WYCO-C, WYCO-F	5,501	555	30	2	587	4,914	<1
		WYCO-D	5,501	555	30	5	590	4,911	<1
Colorado									
South Beach Public River Access[1]	Colorado Parks and Wildlife	WYCO-D	141	141	0	0	141	0	0
Yampa River State Park and Yampa River	Colorado Parks and Wildlife	WYCO-D	282	169	0	1	170	112	<1
Juniper Mountain Special Recreation Management Area	BLM Little Snake Field Office	WYCO-D	1,776	19	0	21	40	1,737	1
Motorized trails[3]	BLM Little Snake Field Office	WYCO-B, WYCO-C, WYCO-F	1,333	28	32	14	74	1,259	1
		WYCO-D	1,045	110	9	7	125	919	<1

NOTES:

[1] Zero in Incremental Project Development indicates the alternative route and associated right-of-way overlaps past and present actions and/or spans a recreation area.

[2] Because of the length of the linear preservation and recreation features, cumulative effects on linear features are limited to the cumulative impact analysis area (CIAA). The percent of incremental project development is reported for these features only in the CIAA.

[3] Due to the number of motorized trails located in the CIAA, motorized trails were not analyzed individually.

Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Yampa River State Park

The Project would not contribute incrementally to cumulative effects on the Yampa River State Park as the Project right-of-way would be located in an area of existing cumulative development for past actions. Also, because the Project would be designed to span the site, permanent infrastructure would not affect the site. Past and present actions in the Yampa River State Park include:

- active oil and gas leases on Colorado State Land
- Bears Ears to Bonanza 345kV transmission line
- Craig to Rifle 345kV transmission line
- Hayden to Artesia 138kV transmission line
- D&RGW Railroad
- County Road 23, Colorado State Highway 13, and U.S. Highway 40

There are no RFFAs in the Yampa River State Park. The short-term cumulative effects of the Project and past and present actions would be limited and/or altered access and increased noise during construction of the Project. The long-term cumulative effect would be the additional transmission line spanning the state park.

Motorized Trails

The Project would not contribute incrementally to cumulative effects on motorized trails as the Project would be designed to span the trails; consequently, permanent infrastructure would not be located directly on the trails. Past and present actions in the area traversed by the motorized trails include vegetation treatments completed by the BLM Little Snake Field Office, a 10-inch diameter pipeline owned by Plains All American GP LLC, 10-inch diameter pipeline owned by Plains All American GP LLC, 10-inch diameter pipeline owned by Questar Corporation, Craig to Rifle 345kV transmission line and Hayden to Artesia 138kV transmission line, U.S. Highway 40 and County roads, and oil and/or gas leases on Colorado state lands. An RFFA in the area traversed by motorized trails would be the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing motorized trails in addition to the past and present actions and RFFAs would be limited access to the trails during construction. Long-term cumulative impacts on motorized trails would not be anticipated.

Outlaw Trail Loop Scenic Drive

The Project would not contribute incrementally to cumulative effects on the Outlaw Trail Loop Scenic Drive as the Project would be designed to span the scenic highway; consequently, no permanent infrastructure would be located directly on the scenic highway.

Past and present actions in the CIAA for the Outlaw Trail Loop Scenic Drive include:

- Atlantic Rim oil and/or gas field
- Gateway West Transmission Project
- 12-inch diameter pipeline owned by General Electric Co., 14-inch diameter pipeline owned by ONEOK Inc., and a 6-inch diameter pipeline owned by Plains All American GP LLC
- Sinclair to Bar X 230kV transmission line
- Union Pacific Railroad
- I-80, Wyoming Highway 789, Colorado State Highway 13, and County Road 2N
- spike treatments in the BLM Rawlins Field Office
- Wyoming state land coal and oil and gas leases

RFFAs in the CIAA for the scenic highway include:

- Continental Divide-Creston Junction oil and gas project
- TransWest Express Transmission Project

The short-term cumulative effects of the Project crossing the scenic highway, in addition to past and present actions and RFFAs, would be increased traffic and potential delays for users or required detours during construction of the Project. A long-term cumulative effect would be the additional transmission line spanning the scenic highway. Cumulative effects for the scenic highway also are discussed in Section 4.3.18.

Rawlins to Baggs Historic Road

The Project would not contribute incrementally to cumulative effects on the Rawlins to Baggs Historic Road (historic trail) as the Project would be designed to span the historic trail; consequently, no permanent infrastructure would be located directly on the historic trail. Past or present actions that affect the historic trail in the CIAA for the WYCO alternative routes include:

- prescribed fires in BLM Rawlins Field Office
- Atlantic Rim oil and or gas field
- coal, oil, and gas leases on Wyoming State Land
- Gateway West Transmission Project
- 42-inch diameter pipeline owned by Kinder Morgan Inc.; a 36-inch diameter pipeline owned by El Paso Corporation, a 24-inch diameter pipeline owned by El Paso Corporation, a 22-inch diameter pipeline owned by El Paso Corporation, a 20-inch diameter pipeline owned General Electric Co., a 16-inch diameter pipeline owned by ONEOK Inc., a 8-inch diameter pipeline owned by Plains All American GP, LLC, and a 6-inch diameter pipeline owned by MidAmerican Energy Holdings Company
- Sinclair to Bar X 230kV transmission line
- Union Pacific Railroad
- I-80, Wyoming Highway 789, U.S. Highway 287, and County Road 63

An RFFA in the historic trail includes the Hogback Ridge (Whirlwind I) Wind Energy Project, Continental Divide-Creston Junction Oil and Gas Project, and the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the historic trail, in addition to the past and present actions and RFFAs, would be potentially limiting access to the historic trail and increased noise during construction. The long-term cumulative effects would be increased industrialization spanning the historic trail.

Juniper Mountain Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the Juniper Mountain SRMA as the Project right-of-way is located in an area that has past and present actions. Past and present actions in the SRMA include secondary roads. There are no RFFA proposed in the SRMA. The short-term cumulative effects of the Project and past and present actions would potentially limit and/or hinder access to and/or in the SRMA and increase noise during construction. The long-term cumulative effects would be additional industrial development in the SRMA, which potentially could limit some recreational opportunities.

North Platte Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the North Platte SRMA as the Project right-of-way is located in an area that has past and present actions. Past and present actions in the SRMA include:

- 8-inch diameter pipeline owned by ConocoPhillips
- 36-inch, 24-inch, and 22-inch diameter pipelines owned by El Paso Corporation
- 42-inch diameter pipeline owned by Kinder Morgan, Inc.
- 16-inch diameter pipeline owned by ONEOK, Inc.
- Gateway West Transmission Project
- Seminoe to Sinclair 115kV transmission line
- prescribed fires in the BLM Rawlins Field Office
- Chokecherry Wind Farm Expansion
- Union Pacific Railroad
- secondary roads

There is no RFFA proposed in the SRMA. The short-term cumulative effects of the Project and past and present actions potentially would limit and/or alter access to and in the SRMA and increase noise during construction. The long-term cumulative effects would be additional industrial development in the SRMA, which potentially could limit some recreational opportunities.

4.3.12.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Past and present actions and RFFAs in parks, preservation, and recreation resource areas crossed by the COUT BAX alternative routes are presented in Table 4-121 and the potential cumulative effects are discussed for each park, preservation, and recreation resource area below.

Effects

Nephi Shooting Range

The Project would not contribute incrementally to cumulative effects on Nephi Shooting Range as the Project would be designed to span the site; consequently, permanent infrastructure would not affect the site. There are no past and present actions or RFFAs that occur in the Nephi Shooting Range. The short-term cumulative effects of the Project crossing the Nephi Shooting Range would be the same as the affected environment and environmental consequences described in Section 3.2.12.

Snow Kite Play Areas

The Project would not contribute incrementally to cumulative effects on the snow-kite play areas as the Project would be located in an area where other past and present actions are located. Past and present actions in the snow-kite play area include the Skyline Mine and secondary roads. RFFAs proposed or planned in the snow-kite play area include the TransWest Express Transmission Project and the Shalom Electric Boulger Timber Salvage vegetation management project. The short-term cumulative effects of the Project crossing the snow-kite play area, in addition to the past and present actions and RFFAs, would be minimal because construction actions would likely not occur in the area during the play area's peak use (winter). Long-term effects would be limited access to portions of the snow-kite play areas and an increased potential for user conflicts with aboveground facilities associated with the proposed transmission facilities.

TABLE 4-121
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Multi-State									
Dinosaur Diamond Scenic Byway[1]	U.S. Department of Transportation, Federal Highway Administration	COUT BAX-B	27,072	16,133	450	6	16,589	10,483	<1
		COUT BAX-C	27,072	16,133	450	8	16,591	10,481	<1
		COUT BAX-E	27,072	16,133	450	8	16,591	10,481	<1
Motorized trails[1, 2]	Bureau of Land Management (BLM) and U.S. Forest Service	COUT BAX-B	4,977	491	82	62	635	4,342	1
		COUT BAX-C	6,202	498	973	60	1,531	4,671	<1
		COUT BAX-E	3,756	185	98	65	348	3,407	2
Colorado									
There are no parks, preservation, or recreation resources crossed by the COUT BAX alternative routes in Colorado.									
Utah									
Snow Kite Play Areas[3]	Sanpete County	COUT BAX-E, COUT-H	723	710	0	0	710	13	0
Nephi Shooting Range[2]	City of Nephi	All COUT BAX	37	37	0	0	37	0	0
Ephraim Recreation Camp	LDS Church	COUT BAX-E	172	172	0	0	172	0	0
Paradise Creek Trailhead[3]	Manti-La Sal National Forest	COUT BAX-B, COUT BAX-C	0	0	0	0	0	0	0
Labyrinth Canyon SRMA	BLM Price Field Office	All COUT BAX	37,203	26	3	1	30	37,173	<1
Labyrinth Rims/ Gemini Bridges SRMA	BLM Moab Field Office	All COUT BAX	299,971	4,290	71	39	4,400	295,572	<1
San Rafael Swell SRMA	BLM Price Field Office	COUT BAX-B	936,425	5,176	3,620	70	8,866	927,558	<1
		COUT BAX-C		5,176	3,620	0	8,796	927,628	0

TABLE 4-121
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Skyline Drive Scenic Backway[1, 3]	Manti-La Sal National Forest	COUT BAX-B, COUT BAX-C	4,151	1,539	3	1	1,544	2,608	<1
		COUT BAX-E	10	4	0	0	4	7	0
Energy Loop Scenic Byway[3]	Manti-La Sal National Forest	COUT BAX-B, COUT BAX-C	10	4	0	0	4	7	0
		COUT BAX-E	5,452	2,577	31	4	2,612	2,840	<1
Wedge Overlook/ Buckhorn Draw Scenic Backway[1, 3]	BLM Price Field Office	COUT BAX-B, COUT BAX-C	3,320	230	21	0	251	3,069	0
Maple Fork Trail[1]	Manti-La Sal National Forest	COUT BAX-E	64	1	0	2	2	61	3
Booths Canyon Trail[1]	Manti-La Sal National Forest	COUT BAX-B, COUT BAX-C	12	1	0	2	2	10	17

NOTES:
[1] Because of the length of the linear preservation and recreation features, cumulative effects on linear features are limited to the cumulative impact analysis area (CIAA). The percent of incremental project development is reported for these features only in the CIAA.
[2] Due to the number of motorized trails located in the CIAA, motorized trails were not analyzed individually.
[3] Zero in Incremental Project Development indicates the alternative route and associated right-of-way overlap past and present actions and/or spans a recreation area.
Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

LDS Church Ephraim Recreation Camp

The Project would not contribute incrementally to cumulative effects on the LDS Church Ephraim Recreation Camp as the Project would be located in an area where other past and present actions are located. Past and present actions in the LDS Church Ephraim Recreation Camp include the Flat Canyon Coal Lease tract, and oil and gas units in the BLM Richfield Field Office. There are no RFFAs proposed or planned in the LDS Church Ephraim Recreation Camp. The short-term cumulative effects of the Project crossing the Ephraim Recreation camp, in addition to the past and present actions, would potentially limit and/or hinder access to and/or in the recreation camp and increase noise during construction. The long-term cumulative effects would be additional industrial development in the recreation camp, which potentially could limit some recreational opportunities.

Paradise Creek Trailhead

The Project would not contribute incrementally to cumulative effects on the Paradise Creek Trailhead as the Project would be designed to span the site; consequently, permanent infrastructure would not affect the site. There are no past or present and RFFAs proposed or planned on the Paradise Creek trailhead. The cumulative effects of the Project crossing the Paradise Creek trailhead would be the same as those discussed in Section 3.2.12.

Booths Canyon Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on the Booths Canyon Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the non-motorized trail. Past and present actions in the area traversed by the non-motorized trail include oil and/or gas leases in the BLM Richfield Field Office. An RFFA planned in the area traversed by the Booths Canyon Non-motorized Trail includes a UDWR watershed restoration focus area. The short-term cumulative effects of the Project crossing the non-motorized trail, in addition to the past and present actions and an RFFA, could limit the access to the trail during construction actions. The long-term effects on the Booths Canyon Non-motorized Trail would not be anticipated

Maple Fork Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on the Maple Fork Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the trail. There are no past and present actions or RFFAs in the area traversed by the Maple Fork Non-motorized Trail. The cumulative effects of the Project crossing the trail would be same as the direct and indirect impacts described in the Section 3.2.19.

Motorized Trails

The Project would not contribute incrementally to cumulative effects on motorized trails as the Project would be designed to span the trails; consequently, permanent infrastructure would not be located directly on the trails. Past and present actions in the area traversed by the motorized trails include:

- BLM oil and/or gas leases in the BLM Grand Junction, Moab, Price, and Richfield Field Offices
- Deer Creek Coal Lease
- Ferron Natural Gas Project
- SITLA-administered oil and/or gas, coal leases
- 26-inch diameter pipeline owned by Williams Companies Inc., 12-inch and a 10-inch diameter pipelines owned by Enterprise Products Partners LP
- Huntington to Emery 345kV transmission line

- Huntington to Pinto 345kV transmission line
- Mona to Huntington 345kV transmission line
- Spanish Fork to Emery 345kV transmission line
- Historic fires
- U.S. Highway 6 and secondary roads

RFFAs proposed or planned in the area traversed by the motorized trails include:

- TransWest Express Transmission Project
- Woodside power-generation facility
- UDWR watershed-restoration focus areas

The short-term cumulative effects of the Project crossing motorized trails in addition to the past and present actions and RFFAs would be limited access to the trails during construction actions. Long-term cumulative impacts on motorized trails would not be anticipated.

Dinosaur Diamond Scenic Byway

The Project would not contribute incrementally to cumulative effects on Dinosaur Diamond Scenic Byway as the Project would be designed to span the scenic byway; consequently, permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic byway for COUT-BAX-B include:

- Banning Siding Loadout
- Emery County Lease – Mancos Hills Industrial Park
- Karren Industrial
- Roosevelt Pipeline
- Tuck it Away Storage
- Gilsonite mining
- Active oil and gas, humic shale, metalliferous minerals, tar sands, and potash SITLA leases
- oil and/or gas leases in the BLM Grand Junction, Moab, Price, Vernal, and White River Field Offices
- Victory pipeline
- Arches overlook recreation area
- Highland estates residential development
- New Helper Townsite residential development
- Uinta Mountain Vista residential development
- Private residential developments
- Woodside to Sphinx 46kV transmission line
- Mounds to Moab 138kV transmission line

There would be no RFFAs for Alternative COUT BAX-B; but for Alternatives COUT BAX-C and COUT BAX-E, an RFFA proposed or planned in the area traversed by the scenic byway is the Woodside power-generation facility. The short-term cumulative effects of the Project crossing the scenic byway in addition to past and present actions and RFFAs would be increased traffic, potential delays for users and/or detours during construction actions. A long-term cumulative effect would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.18.

Energy Loop Scenic Byway

The Project would not contribute incrementally to cumulative effects on the Energy Loop Scenic Byway as the Project would be designed to span the scenic byway; consequently, permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic byway include:

- Skyline Mine
- Flat Canyon Coal Tract
- Kinney No. 2 Mine
- Ferron Natural Gas Project
- Liberty Pioneer Gas Project
- Narrows East Bench, Oak Creek, and Upper Cottonwood Pipelines, highway relocation, reservoir, tunnel, and East Bench Diversion dam
- Active oil and or gas; sand and gravel SITLA leases
- 20-inch, 18-inch, and 6-inch diameter pipelines owned by Questar Corporation
- Spanish Fork to Carbon 138kV transmission line
- Spanish Fork to Emery 345kV transmission line
- Spanish Fork to Huntington 345kV transmission line
- oil and/or gas leases in the BLM Price and Richfield Field Offices
- D&RGW Railroad and Rio Grande Railroad
- Historic fires
- U.S. Highway 6 and 89 and state and secondary roads

An RFFA proposed in the area traversed by the scenic byway is the TransWest Express Transmission Project. Short-term cumulative effects of the Project crossing the scenic byway, in addition to past and present actions and an RFFA, would be increased traffic, potential delays for users, and/or detours during construction actions. Long-term cumulative effects would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.18.

Skyline Drive Scenic Backway

The Project would not contribute incrementally to cumulative effects on the Skyline Drive Scenic Backway as the Project would be designed to span the scenic backway; consequently, permanent infrastructure would not be located directly on the scenic backway. Past and present actions in the area traversed by the scenic backway include:

- oil and/or gas leases in the BLM Richfield Field Office
- Narrows Highway relocation
- 18-inch diameter pipeline owned by Questar Corporation
- Mona to Huntington 345kV transmission line
- U.S. Highway 6 and state highways .

RFFAs proposed or planned in the area traversed by the scenic backway include the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the scenic backway, in addition to past and present actions and RFFAs, would be increased traffic, potential delays for users, and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the scenic backway. Cumulative effects for the scenic backway also are discussed in Section 4.3.18.

Wedge Overlook/Buckhorn Draw Scenic Backway

The Project would not contribute incrementally to cumulative effects on the Wedge Overlook/Buckhorn Draw Scenic Backway as the Project would be designed to span the scenic backway; consequently, permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic backway include the active SITLA-administered oil and/or gas leases, Huntington to Emery 345kV transmission line, and Spanish Fork to Emery 345kV transmission line, I-70, state, and secondary roads. RFFAs proposed or planned in the area traversed by the scenic backway include the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the scenic backway, in addition to past and present actions and RFFAs, would be increased traffic, potential delay to users, and/or detours during the construction actions. The long-term cumulative effects would be increased industrialization along the scenic backway. Cumulative effects for the scenic backway also are discussed in Section 4.3.18.

Labyrinth Canyon Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the Labyrinth Canyon SRMA. Past and present actions in the SRMA include:

- SITLA-administered metalliferous mineral and oil and/or gas leases
- I-70 and secondary roads

An RFFA proposed or planned in the SRMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and RFFAs, would include: potentially limited and/or hindered access to and/or in the SRMA and increased noise during construction actions. The long-term cumulative effects would be additional industrial development in the SRMA, potentially limiting some recreational opportunities.

Labyrinth Rim and Gemini Bridges Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the Labyrinth Canyon and Gemini Bridges SRMA. Past and present actions in the SRMA include:

- oil and/or gas leases in the BLM Moab Field Office
- active SITLA metalliferous mineral, oil and/or gas, and potash leases
- Grand County Arches Overlook
- 26-inch diameter pipeline owned by the Williams Companies Inc.
- 10-inch diameter pipeline owned by the Enterprise Products Partners LP
- Huntington to Pinto 345kV transmission line
- Moab to Hitch 138kV transmission line
- Mounds SW PK to Moab 138kV transmission line
- D&RGW Railroad
- U.S. Highway 191 and state highways
- secondary roads

An RFFA proposed or planned in the SRMA includes the TransWest Express Transmission Project.

The short-term cumulative effects of the Project, in addition to past and present actions and RFFAs, would be potentially limited and/or hindered access to and/or in the SRMA and increased noise during construction actions. The long-term cumulative effects would be additional industrial development in the SRMA, potentially limiting some recreational opportunities.

San Rafael Swell Special Recreation Management Area

The Project would not contribute incrementally to cumulative effects on the San Rafael SRMA. Past and present actions in the SRMA include:

- Huntington to Pinto 345kV transmission line
- historic wild fire activity
- active SITLA-administered building stone, metalliferous mineral, oil and/or gas leases
- I-70, state highway, and secondary roads

RFFAs proposed or planned in the SRMA include:

- TransWest Express Transmission Project
- potential wind farm location

The short-term cumulative effects of the Project, in addition to past and present actions and RFFAs, would include potentially limited and/or hindered access to and/or in the SRMA and increased noise during construction actions. The long-term cumulative effects would be additional industrial development in the SRMA, potentially limiting some recreational opportunities.

4.3.12.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Past and present actions and RFFAs in parks, preservation, and recreation resource areas crossed by the COUT alternative routes are presented in Table 4-122, and the potential cumulative effects are discussed for each park, preservation, and recreation resource area below.

Effects

Nephi Shooting Range

The Project would not contribute incrementally to cumulative effects on the Nephi Shooting Range as the Project would be designed to span the site; consequently, permanent infrastructure would not affect the site. There are no past and present actions or RFFAs that occur in the Nephi Shooting Range. The cumulative effects of the Project crossing the Nephi Shooting Range would be the same as those discussed in Section 3.2.12.

LDS Church Ephraim Recreation Camp

The Project would not contribute incrementally to cumulative effects on the LDS Church Ephraim Recreation Camp as the Project would be located in an area where other past and present actions are located. Past and present actions in the LDS Church Ephraim Recreation Camp include the Flat Canyon Coal Lease tract and oil and gas units in the BLM Richfield Field Office. There are no RFFAs proposed or planned in the LDS Church Ephraim Recreation Camp. The short-term cumulative effects of the Project crossing the Ephraim Recreation Camp, in addition to the past and present actions, would potentially limit and/or hinder access to and/or in the recreation camp and increase noise during construction. The long-term cumulative effects would be additional industrial development in the recreation camp, which potentially could limit some recreational opportunities.

TABLE 4-122
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Multi-State									
Dinosaur Diamond Scenic Byway[1]	U.S. Department of Transportation Federal Highway Administration	COUT-A, COUT-B, COUT-C	27,072	16,133	450	2	16,585	10,487	<1
		COUT-H	27,072	16,133	450	5	16,587	10,485	<1
		COUT-I	27,072	16,133	450	6	16,589	10,483	<1
Colorado									
There are no parks, preservation, or recreation resources crossed by the COUT BAX alternative routes in Colorado.									
Utah									
Private All-terrain Vehicle/Motor-cross Track[2]	Private	COUT-B, COUT-C	71	71	0	0	71	0	0
Snow Kite Play Areas[2]	Sanpete County	COUT-H	723	710	0	0	710	13	0
Nephi Shooting Range[2]	City of Nephi	COUT-A, COUT-B, COUT-C, COUT-H, COUT-I	37	37	0	0	37	0	0
Ephraim Recreation Camp[2]	LDS Church	COUT - H	172	172	0	0	172	0	0
Paradise Creek Trailhead[2]	Manti-La Sal National Forest	COUT-I	0	0	0	0	0	0	0
Nine Mile Canyon Backway[1, 2]	U.S. Department of Transportation, Federal Highway Administration	COUT-A. COUT-B	12	11	0	0	11	0	<1
		COUT-C, COUT-H, COUT-I	4,439	2,041	30	2	2,072	2,367	0

TABLE 4-122
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Indian Canyon Scenic Byway[1, 2]	U.S. Department of Transportation, Federal Highway Administration	COUT-B, COUT-C	2,777	1,334	30	0	1,365	1,411	0
Reservation Ridge Scenic Backway[2]	State of Utah	COUT-A	11	1	0	0	1	10	0
		COUT-B, COUT-C, COUT-H	6	1	1	0	1	4	0
Skyline Drive Scenic Backway[1, 2]	Manti-La Sal National Forest	COUT-I	4,151	1,539	3	1	1,544	7	<1
Energy Loop Scenic Byway[1, 2]	Manti-La Sal National Forest	COUT-B, COUT-H, COUT-I	5,452	2,577	31	0	2,608	2,844	0
White River/ Strawberry Road Scenic Backway[1]	Uinta-Wasatch-Cache National Forest	COUT-A	1,305	126	7	1	135	1,171	<1
Blind Canyon Trail[1]	Manti-La Sal National Forest	COUT-A, COUT-B, COUT-C	179	3	4	2	10	169	1
French Hollow Trail[1]	Uinta-Wasatch-Cache National Forest	COUT-A	343	6	3	2	12	331	<1
Maple Fork Trail[1]	Manti-La Sal National Forest	COUT-H	64	1	0	2	3	61	3
Quitchampau Trail[1]	Ashley National Forest	COUT-B	438	15	4	2	21	417	<1

TABLE 4-122
PARKS AND RECREATION CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Parks or Recreation Area	Managing Agency	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
				Past and Present Development	Reasonably Foreseeable Future Actions				
Willow Creek South Trail[1]	Uinta-Wasatch-Cache National Forest	COUT-A	801	43	170	2	215	586	<1
Booths Canyon Trail[1]	Manti-La Sal National Forest	COUT-I	12	1	0	2	2	10	2
Semi-Primitive Non-Motorized Recreation Opportunity Spectrum	Bureau of Land Management (BLM) Price Field Office	COUT-C	5,834	20	41	18	79	5,755	<1
		COUT-H, COUT-I	5,834	20	41	0	61	5,773	0
Motorized trails[1, 3]	BLM/U.S. Forest Service	COUT-A	1,189	94	61	14	170	1,019	1
		COUT-B	872	109	27	5	140	732	<1
Motorized trails[1, 3]	BLM/U.S. Forest Service	COUT-C	446	82	27	5	114	332	1
		COUT-H	1,386	108	59	12	179	1,207	<1
		COUT-I	1,315	359	24	11	395	921	<1

NOTES:

[1] Because of the length of the linear preservation and recreation features, cumulative effects on linear features are limited to the cumulative impact analysis area (CIAA). The percent of incremental project development is reported for these features only in the CIAA.

[2] Zero in Incremental Project Development indicates the alternative route and associated right-of-way overlaps past and present actions and or spans the area.

[3] Due to the number of motorized trails located in the CIAA, motorized trails were not analyzed individually.

Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

Private Motor-cross Track

The Project would not contribute incrementally to cumulative effects on a private motor-cross track as the Project would be designed to span the track; consequently, permanent infrastructure would not affect the track. Past and present actions in the track include Spanish Fork to Carbon 138kV transmission line. RFFAs proposed or planned include the TransWest Express Transmission Project. The short-term cumulative effects of the Project where it crosses the motor-cross track, in addition to the past and present actions and RFFAs, would be limited access to the track during construction. Long-term cumulative effects on the private motor-cross track are not anticipated.

Snow Kite Play Areas

The Project would not contribute incrementally to cumulative effects on the snow-kite play areas as the Project would be in an area where other past and present actions are located. Past and present actions in the snow-kite play area include Skyline Mine and secondary roads. The RFFAs proposed or planned in the snow-kite play area include TransWest Express Transmission Line and Shalom Timber sale. The short-term cumulative effects of the Project crossing the snow-kite play area, in addition to the past and present actions, would be minimal because construction actions likely would not occur in the area during the play area’s peak use (winter). Long-term effects would be limited access to portions of the snow-kite play areas and an increased potential for user conflicts with aboveground facilities associated with the proposed transmission facilities.

Paradise Creek Trailhead

The Project would not contribute incrementally to cumulative effects on the Paradise Creek Trailhead as the Project would be designed to span the site; consequently, permanent infrastructure would not affect the site. There are no past or present and RFFAs proposed or planned on the Paradise Creek trailhead. The cumulative effects of the Project crossing the Paradise Creek trailhead would be the same as those discussed in Section 3.2.12.

Blind Canyon Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on the Blind Canyon Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the non-motorized trail. The past and present in the area traversed by the Blind Canyon Non-Motorized trail include oil and or gas units BLM Richfield Field Office and Mona to Bonanza 345kV transmission line. An RFFA planned in the area traversed by the non-motorized trail is TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the non-motorized trail would be potentially limited access to the trail during construction actions. Long-term cumulative effects on the Blind Canyon Non-motorized Trail are not anticipated.

Booths Canyon Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on the Booths Canyon Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the non-motorized trail. Past and present actions that occur in the area traversed by the non-motorized trail include oil and/or gas leases in the BLM Richfield Field Office. There are no RFFAs planned in the area traversed by the non-motorized trail. The short-term cumulative effects of the Project crossing the non-motorized trail, in addition to the past and present actions, would be limiting the access to the trail during construction actions. The long-term effects on the Booths Canyon Non-motorized Trail would not be anticipated.

French Hollow Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on the French Hollow Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the non-motorized trail. There are no past and present actions or RFFAs in the area traversed by the non-motorized trail. The cumulative effects of the Project crossing the trail would be same as direct and indirect impacts described in Section 3.2.11 and Section 3.2.17.

Maple Fork Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on the Maple Fork Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the non-motorized trail. The past and present actions near the trail include historic wild fire boundaries. There are no RFFAs in the area traversed by the Maple Fork Non-motorized Trail. The cumulative effects of the Project crossing the non-motorized trail would be same as direct and indirect impacts described in Section 3.2.11.

Quitchampau Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on the Quitchampau Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the non-motorized trail. Past and present actions in the area traversed by the non-motorized trail include the Berry Petroleum South Unit oil and/or gas project, oil and or gas units in the BLM Vernal Field Office, and the Upalco to Panther 138kV transmission line. RFFAs proposed or planned in the area traversed by the non-motorized trail include the TransWest Express Transmission Project. The short-term cumulative effects of the projects crossing the non-motorized trail would include potentially limited access to the trail during construction actions. Long-term cumulative effects on the Quitchampau Non-motorized Trail are not anticipated.

Willow Creek South Non-motorized Trail

The Project would not contribute incrementally to cumulative effects on Willow Creek South Non-motorized Trail as the Project would be designed to span the non-motorized trail; consequently, permanent infrastructure would not affect the non-motorized trail. Past and present actions that occur in the area traversed by the non-motorized trail include the Mona to Bonanza 345kV transmission line, and Lake Canyon oil and/or gas project. The RFFA proposed in the area traversed by the non-motorized trail is the TransWest Express Transmission Project and the Strawberry Highlands – Lost Bear and Willow Creek phases. The short-term cumulative effects of the Project crossing the non-motorized trail, in addition to past and present actions and an RFFA, would include potentially limited access to the trail during construction actions. Long-term cumulative effects on the Willow Creek South Non-motorized Trail are not anticipated.

Motorized Trails

The Project would not contribute incrementally to cumulative effects on motorized trails as the Project would be designed to span the trails; consequently, permanent infrastructure would not be located directly on the trails. Past and present actions in the area traversed by the motorized trails include:

- Berry Petroleum South Unit EIS
- oil and/or gas leases in the BLM Price, Richfield, and Vernal Field Office
- Ferron Natural Gas Project
- Deer Creek Coal lease

- active SITLA oil and/or gas and sand and gravel leases
- Wildcat Loadout project
- 20-inch diameter pipeline owned by Questar Corporation
- Mona to Bonanza 345kV transmission line
- Spanish Fork to Carbon 138kV transmission line
- Spanish Fork to Emery 345kV transmission line
- Spanish Fork to Huntington 345kV transmission line
- Upalco to Panther 138kV transmission line
- D&RGW Railway
- Utah Railway
- U.S. Highway 6
- Historic wildfires

An RFFA proposed or planned in the area traversed by the motorized trails includes the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing motorized trails, in addition to the past and present actions and RFFAs, would be limited access for users to the trails during construction. Long-term cumulative effects on motorized trails would not be anticipated.

Dinosaur Diamond Scenic Byway

The Project would not contribute incrementally to cumulative effects on Dinosaur Diamond Scenic Byway as the Project would be designed to span the scenic byway; consequently, permanent infrastructure would not be located directly on the scenic byway. Past and present actions in the area traversed by the scenic byway include:

- Banning Siding Loadout
- Emery County Lease – Mancos Hills Industrial Park
- Karren Industrial Park
- Roosevelt Pipeline
- Tuck it Away Storage
- Gilsonite mining
- active SITLA-administered oil and/or gas, tar sands, humic shale, metalliferous minerals, and potash leases
- active oil and gas leases in the BLM Moab, Price, Vernal, and White River field offices
- Gusher oil and gas project
- Victory pipeline corridor
- Grand County Arches Overlook
- Highland Estates residential developments
- New Helper town site residential developments
- Uintah Mountain Vista residential developments
- Private residential developments
- Several pipelines
- Several transmission lines
- D&RGW Railroad, Rio Grande Railroad, and Utah Railway
- I-70, several state highways and secondary roads
- historic wildfires

RFFAs proposed or planned in the area traversed by the scenic byway include:

- TransWest Express Transmission Project (not in the area of Alternative COUT-C)
- Uinta Express Pipeline, East Canyon Route
- Carbon Coal Fire Plant
- Woodside geothermal development site

The short-term cumulative effects of the Project crossing the scenic byway, in addition to past and present actions and RFFAs, would include increased traffic, potential delays for users, and/or detours during construction actions. A long-term cumulative effect would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.18.

Energy Loop Scenic Byway

The Project would not contribute incrementally to cumulative effects on Energy Loop Scenic Byway as the Project would be designed to span the scenic byway; consequently, permanent infrastructure would not be located directly on the scenic byway. There are no past and present actions on Alternatives COUT-B, COUT-C, and COUT-I. For Alternative COUT-H, past and present actions in the area traversed by the scenic byway include:

- Skyline Mine
- Flat Canyon Coal Lease Tract
- Kinney No. 2 Mine
- oil and/or gas leases in the BLM Price and Richfield Field Office
- Ferron Natural Gas Project
- Liberty Pioneer Gas Exploration
- active SITLA-administered sand and gravel and oil and/or gas leases
- Narrows Project reservoir, Upper Cottonwood, East Bench, and Oak Creek Pipeline, highway relocation, East Bench Diversion dam, and tunnel
- 20-inch, 16-inch, and 8-inch diameter pipelines owned by Questar Corporation
- Spanish Fork to Carbon 138kV transmission line
- Spanish Fork to Emery 345kV transmission line
- Spanish Fork to Huntington 345kV transmission line
- Historic wildfires
- D&RGW Railroad and Rio Grande Railroad
- U.S. Highway 6 and 89, state, and secondary roads

An RFFA proposed or planned in the area traversed by the scenic byway includes the TransWest Express Transmission Project. Short-term cumulative effects of the Project crossing the scenic byway, in addition to past and present actions and an RFFA, would be increased traffic, potential delays for users, and/or detours during construction actions. Long-term cumulative effects would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.18.

Indian Canyon Scenic Byway

For Alternatives COUT-B, COUT-C, COUT-H, and COUT-I, the Project would not contribute incrementally to cumulative effects on Indian Canyon Scenic Byway as the Project would be designed to span the scenic byway; consequently, permanent infrastructure would not be located directly on the scenic byway.

Past and present actions in the area traversed by the scenic byway include oil and gas units in the BLM Vernal Field Office, active SITLA-administered oil and/or gas leases, Blacktail Ridge oil and or gas project, Lake Canyon oil and or gas project, Carbon to Helper 138kV transmission line, Spanish Fork to Carbon 138kV transmission line, and Upalco to Panther 138kV transmission line, Rio Grande railroad, U.S. Highways 191, 40, and 6. The RFFAs proposed or planned in the area traversed by the scenic byway include the TransWest Express Transmission Project.

The short-term cumulative effects of the Project crossing the scenic byway, in addition to past and present actions and RFFAs, would be a potential for increased delays for users and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the scenic byway. Cumulative effects for the scenic byway also are discussed in Section 4.3.18.

Nine Mile Canyon Backway

The Project would not contribute incrementally to cumulative effects on Nine Mile Canyon Scenic Backway as the Project would be designed to span the scenic backway; consequently, permanent infrastructure would not be located directly on the scenic backway. Past and present actions in the area traversed by the scenic backway include:

- the West Tavaputs Plateau oil and/or gas development
- active SITLA coal, and oil and gas leases
- Gasco oil and/or gas development
- Rye Patch Oil Drilling
- Solider Canyon Mine,
- Carbon County ATV trail
- 20-inch, 18-inch, and 6-inch diameter pipelines owned by Questar Corporation
- Mounds SW PK to Bar X 230kV transmission line
- U.S. Highway 40 and secondary roads

RFFAs proposed or planned in the area traversed by the backway include the TransWest Express Transmission Project, Monument Butte oil and or gas project, and Uinta Express Pipeline- East Canyon route. The short-term cumulative effects of the Project crossing the backway, in addition to past and present actions and RFFAs, would be increased traffic that would cause potential delay for users and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the backway. Cumulative effects for the scenic backway also are discussed in Section 4.3.18.

Reservation Ridge Scenic Backway

The Project would not contribute incrementally to cumulative effects on Reservation Ridge Scenic Backway as the Project would be designed to span the scenic backway; consequently, permanent infrastructure would not be located directly on the scenic backway. There are no past and present actions or RFFAs proposed or planned in the area traversed by the scenic backway. The cumulative effects of the Project would be the same that are discussed in Section 3.2.12.

Skyline Drive Scenic Backway

The Project would not contribute incrementally to cumulative effects on the Skyline Drive Scenic Backway as the Project would be designed to span the scenic backway; consequently, permanent infrastructure would not be located directly on the scenic backway. Past and present actions in the area traversed by the scenic backway include oil and gas leases in the BLM Richfield Field Office and Narrow Reservoir highway relocation, Mona to Huntington 345kV transmission line, 18-inch diameter pipeline owned by Questar Corporation, U.S. Highway 6 and state highways. RFFAs proposed or planned in the area traversed by the scenic backway would be the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the backway, in addition to past and present actions and RFFAs, would be increased traffic, potential delays for users, and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the backway. Cumulative effects for the scenic backway also are discussed in Section 4.3.18.

White River/Strawberry Road Scenic Backway

The Project would not contribute incrementally to cumulative effects on the White River/Strawberry Road Scenic Backway as the Project would be designed to span the scenic backway; consequently, permanent infrastructure would not be located directly on the scenic backway. A past and present action in the area traversed by the scenic backway would be the Mona to Bonanza 345kV transmission line. The RFFAs proposed or planned in the area traversed by the scenic backway include the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the backway, in addition to the past and present action, would be potential increased of traffic, delays for users, and/or detours during construction actions. The long-term cumulative effects would be increased industrialization along the scenic backway.

Semi-Primitive Non-motorized Recreation Opportunity Spectrum Area

The Project would not contribute incrementally to cumulative effects on the Semi-Primitive Non-motorized ROS area in the Vernal Field Office. Past and present actions in this ROS classification include active SITLA-administered oil and/or gas leases. The RFFA proposed in this ROS classification is the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing this ROS category, in addition to the past and present action and RFFA, potentially would be limited access to the ROS category and increased noise during construction actions. Long-term effects on the semi-primitive non-motorized ROS area are not anticipated.

4.3.13 Transportation and Access

The approach for analysis of cumulative effects on transportation and access, including the geographic and temporal scopes defined for analysis, are presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.13.4.2) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2. The major transportation network and features are illustrated on MV-13a and MV-13b.

4.3.13.1 Issues Identified for Analysis

Issues that have been identified in relation to transportation and access (refer to Section 3.2.13.2) include concerns that the towers possibly would interfere with airport and landing strip operations, that small county roads crossed by the project would need to be maintained and not blocked or changed from uses defined in county transportation plans, and that conflicts between transportation/access users and the Project would occur during construction and potentially during operation and maintenance of the Project.

4.3.13.2 Existing Condition

Roadways, such as interstates, highways (U.S. and state), and secondary roads are parallel to and crossed by the alternative routes. These roadways occur throughout the Project area. Generally, these roadways are identified as past and present activities with many of the other past and present activities being accessed by the roadways.

Small aviation facilities occur throughout the Project area on public and privately owned lands. Most of the airports are located on the outskirts of their associated cities or towns with airstrips associated with rural development and agricultural livestock operations occurring in less populated areas. These aviation facilities are considered as past and present activities and are associated with other existing land uses.

Railroad lines occur throughout the Project area with portions of the alternative routes in Wyoming and Utah paralleling the rail lines. Similar to roadways and aviation facilities, these railroad lines are considered as past and present activities with some of the railroads supporting operations of other past and present actions (i.e., railroads from coal sources to power plants).

4.3.13.3 Results

4.3.13.3.1 Roadways

Potential environmental effects of roadways discussed in Section 3.2.13.4.2 form the basis for cumulative effects of the Project and RFFAs on the environment as discussed below.

Effects

Existing roadways would be used to the extent practical to provide access for the Project and RFFAs (as identified in Table 4-1). There would be the potential that existing roadways could be used simultaneously by the Project and RFFAs, increasing the use of the roadways beyond localized use. Increased traffic on these existing roadways to access the Project and RFFAs would require increased maintenance and temporary road closures/delays and detours during construction.

Where access to the Project and other RFFAs cannot be gained using existing roadways, new access and/or improved access would occur. In some instances new access and improved access would be used by the Project and RFFAs; however, the practicality of this is not known because the Project typically requires access to all its on-the-ground components (i.e., transmission structures, communication facilities, and series compensation stations) for construction, operation, and maintenance. Even though new access developed and existing access improved by the Project and RFFAs would be closed to the public, the potential for unauthorized users to access areas previously inaccessible could result in requirements for additional agency administrative considerations, such as law enforcement, maintenance and associated costs, and emergency response.

4.3.13.3.2 Aviation Facilities

The potential environmental effects of aviation facilities discussed in Section 3.2.13.4.2 form the basis for effects of the Project and RFFAs on the environment as discussed below.

Effects

Construction of the Project and RFFAs (refer to Table 4-2) with aboveground components, such as the TransWest Express Transmission Project would be constructed considering requirements associated with existing aviation-facility operations. The addition of the Project and RFFAs also could increase safety concerns associated with operation of aviation facilities. The implementation of the Project and RFFAs also could result in limiting the expansion of these aviation facilities in the future.

4.3.13.3.3 Railroads

The potential environmental effects of railroads discussed in Section 3.2.13.4.2 form the basis for effects of the Project and RFFAs on the environment as discussed below.

Effects

Railroads would be crossed by the Project and some RFFAs (other linear RFFAs are included in Table 4-1). Operations of the railroads would be altered during construction and safety concerns would be increased with the location of the Project and RFFAs near the railroads, such as a clearance issues and railroad set-back issues due to limited space. Implementation of the Project and RFFAs also could limit the ability of the railroads to expand/or reroute should the need arise in the future.

4.3.14 Congressional Designations

The approach for analysis of cumulative effects on congressional designations including the geographic and temporal scopes defined for analysis is presented in Table 4-3. This analysis relies on the results of direct and indirect impacts from the Project (refer to Section 3.2.14) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2. Direct or indirect project effects would not be anticipated for wilderness areas, national monuments, national heritage areas, and NCAs or WSAs. Thus, only potential cumulative effects on river segments found suitable for inclusion into the WSR System are discussed in this section.

4.3.14.1 Issues Identified for Analysis

4.3.14.1.1 Potential Impacts on Congressional Designations

The potential cumulative impacts on river segments found suitable for inclusion into the WSR system is impairment of its tentative classification and outstandingly remarkable values.

4.3.14.2 Existing Condition

Past and present actions occur on some congressional designations in the geographic scope, but the majority of these areas have little to no human influences. The natural environment has been altered in a way that allows for past and present actions such as recreational infrastructure, oil and/or gas development, roads, pipelines, transmission lines, etc., but is still compatible with the features or values for which the congressional designation was designated.

4.3.14.3 Results

4.3.14.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

The WYCO alternative routes including Alternative WYCO-B, the Agency Preferred Alternative and the Applicant Preferred Alternative, in Wyoming and Colorado would not result in any direct or indirect impacts on any congressionally designated areas, WSAs, or suitable WSR segments. Thus, the Project would not contribute to cumulative impacts on these areas.

4.3.14.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

The COUT BAX alternative routes in Colorado and Utah would not have any direct or indirect impacts on congressionally designated areas, WSAs, or suitable WSR segments. Thus, the Project would not contribute to cumulative impacts on these areas.

4.3.14.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Past and present actions and RFFAs in the CIAA crossed by the COUT alternative routes are listed in this section. Table 4-123 is a summary of the cumulative effects, including the incremental Project contribution.

TABLE 4-123
CONGRESSIONAL DESIGNATIONS OR POTENTIAL CONGRESSIONAL DESIGNATIONS CUMULATIVE EFFECTS SUMMARY FOR ALL ALTERNATIVE ROUTES IN ACRES

Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Wyoming										
There are no congressional designations crossed in Wyoming for the WYCO alternative routes.										
Colorado										
There are no congressional designations crossed in Colorado for the WYCO, COUT BAX, and COUT alternative routes.										
Utah										
Lower Green River Suitable Wild and Scenic River segment	Bureau of Land Management Vernal Field Office	Outstandingly remarkable values are recreation and fish with a tentative classification of scenic	COUT-C, COUT-H, COUT-I	11,968	765	31	12	809	11,159	<1

NOTES:
Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.
Impacts on wilderness management areas associated Utah Reclamation Mitigation and Conservation Commission lands are discussed in Section 4.3.15.

Effects

Lower Green River Suitable Wild and Scenic River Segment

Past and present actions that occur in the CIAA for the suitable WSR segment include:

- Gilsonite mining on the eastern side of the river
- Active oil and/or gas and metalliferous mineral leases on SITLA-managed land
- Oil and/or gas leases managed by the BLM Vernal Field Office
- XTO Energy's Riverbend Directional Infill oil and/or gas development
- Gasco Energy, Inc. Uinta natural gas development
- Bill Barrett Corporation West Tavaputs Plateau oil and/or gas development
- Developed rights-of-way for 20-inch diameter Questar pipelines (two)

RFFAs proposed or planned in the CIAA for the Lower Green River Suitable WSR segment include:

- TransWest Express Transmission Project
- Newfield's Monument Butte oil and/or gas development

The percentage of cumulative effects on the Lower Green River Suitable WSR that would be attributable to the Project would be less than 1 percent (refer to Table 4-123). The Project right-of-way is located in an area that has past and present actions and RFFAs.

If this route were selected for both the Project and the TransWest Express Transmission Project, and both projects were constructed, short-term effects from the two transmission projects crossing the suitable WSR would include increased noise and dust; increased activity along both sides of the river disturbing recreation users; and could affect recreational access to the river during construction in the Project area. No new access routes for the Project would be constructed within the 0.25 mile from the bank on each side of the river. It is also assumed that no new access routes for the TransWest Express Transmission Project would be constructed.

The construction of the two projects would not affect the river's free-flowing condition. Long-term cumulative effects on the outstandingly remarkable values described for recreational opportunities and fish would not be anticipated. The presence of the two projects would affect the view and experience of recreational users traveling on the river (i.e., rafting, canoeing) but would not hinder opportunities for fishing, hunting, waterfowl viewing, floating, and camping. Recreationists at the Fourmile Bottom put-in, as well as floating on this portion of the Green River, would have views intermittently influenced by development. These include views of an existing pipeline corridor from maintenance activities and potential views of existing wells and/or future development of areas leased for oil and gas development where the adjacent canyon walls are shorter and do not screen views from the river. Through the introduction of the Project and the TransWest Express Transmission Project, views at and adjacent to the Fourmile Bottom put-in would be modified by skylined transmission structures and access road construction in steep terrain as shown in the cumulative effects simulation. To reduce cumulative effects on these views, potential mitigation would include colocation of the two transmission projects and maximizing the distance between structures at the river crossing to reduce their dominance within the Lower Green River viewshed to the extent that is technically feasible. These measures would include limiting the construction of new access roads within view of the river and positioning the transmission line structures where they would less visible from the river to the extent practicable.

Utah Reclamation Mitigation and Conservation Commission Lands

The percentage of the Project impact on URMCC managed lands would be less than 1. There are no past and present actions or RFFAs that are directly related to these lands but past and present actions and

RFFAs are in the WMAs associated with these lands. Currant Creek and Tabby Mountain WMAs are discussed in more detail in Section 4.3.15.

4.3.15 Special Designations and Other Management Areas

The approach for analysis of cumulative effects on special designation and other management areas including the geographic and temporal scopes defined for analysis is presented in Table 4-3. This analysis relies on the results of direct and indirect impacts from the Project (refer to Section 3.2.15) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.15.1 Issues Identified for Analysis

4.3.15.1.1 Potential Impacts on Special Designations and Other Management Areas

Potential conflicts include crossing conservation easements that prohibit future transmission lines from crossing them and crossing special designations that are exclusion or avoidance areas for future utility development. These impacts would be intensified where other existing actions have already affected a special designation and/or other management area or an RFFA is proposed in the same area. Whether the Project is compounding an existing or RFFA, the cumulative effect on the reason for the designation of a special designation and/or other management area may result in the area not being managed for what it was originally intended.

4.3.15.2 Existing Condition

Past and present actions generally occur on almost all special designation and other management areas in the geographic scope. The natural environment has been altered in a way that allows for past and present actions such as recreational infrastructure, oil and/or gas development, roads, pipelines, transmission lines, etc., but is still compatible with the natural feature for which the special designation or other management area was designated.

Past and present actions do not occur on some special designation and other management areas in the geographic scope. These areas are being protected for natural and undisturbed conditions. This would include some conservation easements, wildlife management areas, and URMCC-managed lands.

4.3.15.3 Results

4.3.15.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Past and present actions and RFFAs in special designation and other management areas crossed by the WYCO alternative routes are presented in Table 4-124, and the potential cumulative effects are discussed for each special designation and other management area below.

Effects

The following summarizes the cumulative effects on special designations and other management areas that would be crossed by the WYCO alternative routes, including what past and present actions and/or RFFAs that have or could occur in the boundary of these special designations or other management areas in addition to the Project.

TABLE 4-124 SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES										
Name	**Managing Agency**	**Management Values**	**Alternative Route**	**Total Available Resource**	**No Action Alternative**		**Incremental Project Development**	**Estimated Cumulative Development**	**Remaining Available Resource**	**Percent of Project Impact**
					Past and Present Development	**Reasonably Foreseeable Future Actions**				
Wyoming										
Red Rim-Daley Wildlife Habitat Management Area (WHMA)	Wyoming Game and Fish Department	Crucial winter habitat for pronghorn and nesting habitat for raptors	All WYCO	25,990	1,348	118	62	1,528	24,462	<1%
Upper Muddy Creek Watershed/ Grizzly WHMA	Bureau of Land Management (BLM) Rawlins Field Office/ Wyoming Game and Fish Department	Habitat for Colorado River fish species unique to Muddy Creek watershed and crucial winter habitat for elk and mule deer	WYCO-D	59, 783	764	506	8	1,278	58,506	<1%
Adobe Town Wild Horse Herd Management Area	BLM Rawlins Field Office	To provide a protected area for up to 812 wild horses after foaling season	WYCO-B	477,624	3,305	1,016	210	4,532	473,092	<1%
			WYCO-C		3,305	1,016	204	4,526	473,098	<1%
			WYCO-F		3,305	1,016	9	4,330	473,293	<1%
Colorado										
There are no special designations or other management areas crossed in Colorado for the WYCO alternative routes.										
Utah										
Moffat County Road #11 Land and Water Conservation Fund site	Moffat County, National Park Service (NPS)	Funding provided by NPS to construct the road	WYCO-D	590	38	3	1	43	547	<1%

TABLE 4-124
SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES IN ACRES

Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Yampa River Recreation Area Land and Water Conservation Fund site	Moffat County, NPS	Funding provided by NPS to develop a recreation area	All WYCO	3,781	934	10	2	945	2,836	<1%
Bitterbrush State Wildlife Area	Colorado Parks and Wildlife	Provides hunters and wildlife viewers opportunities to see mule deer, elk, and pronghorn	WYCO-D	8,079	418	113	54	584	7,495	<1%
Tuttle Ranch Conservation Easement	Colorado Parks and Wildlife	To protect white-tailed prairie dog complex by allowing the reintroduction of black-footed ferrets and conservation of sage-grouse leks	WYCO-B, WYCO-C, WYCO-F	15,067	229	90	46	365	14,702	<1%
Cross Mountain Ranch Conservation Easement	Colorado Cattleman Agricultural Land Trust	To protect agricultural lands, big game habitat and migration corridors, habitat for special status species and the greater sage grouse	All WYCO	16,058	321	125	16	462	15,596	<1%

Red Rim-Daley Wildlife Habitat Management Area

The percentage of the Project in the Red Rim-Daley WHMA would be less than 1 percent. Past and present actions occurring in the Red Rim-Daley WHMA include:

- Anadarko Atlantic Rim natural gas development
- A uranium mining lease on Wyoming state land
- Gateway West Transmission Project
- 22-inch, 24-inch, and 36-inch diameter pipelines owned by El Paso Corporation;
- 12-inch and 20-inch diameter pipelines owned by General Electric Co.;
- 42-inch diameter pipeline owned by Kinder Morgan Inc.;
- 14-inch diameter pipeline owned by ONEOK Inc.
- Sinclair to Bar-X 230kV transmission line
- Union Pacific Railroad
- prescribed burns and vegetation treatments completed by the BLM Rawlins Field Office
- I-80 with additional secondary roads (county and access roads)

RFFAs proposed or planned in the Red Rim-Daley WHMA include:

- TransWest Express Transmission Project
- Hogback Ridge (Whirlwind I) Wind Energy Project
- BP Continental Divide-Creston Junction natural gas development

The short-term cumulative effects of the Project, in addition to past and present actions and other RFFAs proposed in this area, would be increased noise from construction equipment, limited access to a portion of the WHMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the WHMA, which potentially would limit management actions associated with pronghorns and raptors in the WHMA.

Upper Muddy Creek Watershed/Grizzly Wildlife Habitat Management Area

The percentage of the Project in the Upper Muddy Creek Watershed/Grizzly WHMA would be less than 1 percent. Past and present actions that occur in the Upper Muddy Creek Watershed/Grizzly WHMA include:

- Anadarko Atlantic Rim natural gas development
- Power Company of Wyoming's Sierra Madre wind farm
- 12-inch diameter pipeline owned by Devon Energy Corporation
- prescribed burns completed by the BLM Rawlins Field Office
- Wyoming Highway 789

RFFAs proposed or planned in the Upper Muddy Creek Watershed/Grizzly WHMA include:

- BP Continental Divide – Creston Junction natural gas development
- TransWest Express Transmission Project.

The short-term cumulative effects of the Project, in addition to past and present actions and other RFFAs proposed in this area, would be increased noise from construction equipment, limited access to a portion of the WHMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the WHMA, which potentially would limit management actions associated with fish habitat in the Muddy Creek watershed and elk and mule deer in the WHMA.

Adobe Town Wild Horse Herd Management Area

The percentage of the Project in the Adobe Town WHHMA would be less than 1 percent. Past and present actions in the Adobe Town WHHMA include:

- oil and/or gas leases on Wyoming state land
- 6-inch diameter pipeline owned by Anadarko Petroleum Corporation
- 20-inch, 24-inch diameter pipelines owned by El Paso Corporation
- 8-inch and 12-inch diameter pipelines owned by General Electric Co.
- 36-inch diameter pipeline owned by Kinder Morgan Inc.
- 14-inch diameter pipeline owned by ONEOK Inc.
- 8-inch, 10-inch, and 12-inch diameter pipelines owned by Questar Corporation
- County Road 144, 19, 25, 62, and 68
- prescribed burns completed by the BLM Rawlins Field Office

RFFAs proposed or planned in Adobe Town WHHMA include:

- BP Continental Divide – Creston Junction natural gas development
- Hiawatha Regional Energy Development oil and/or gas development
- TransWest Express Transmission Project

The short-term cumulative effects of the Project, in addition to past and present actions and other RFFAs proposed in this area, would be increased noise from construction equipment, limited access to a portion of the WHHMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WHHMA are not anticipated.

Moffat County #11 Land and Water Conservation Fund Site

The percentage of the Project in the Moffat County #11 LWCF site would be 0 percent as the Project would span the site; consequently, no permanent infrastructure located on the site. Past and present actions on the LWCF site include oil and/or gas lease activity on Colorado state land, Colorado State Highway 13 and County Road 11. An RFFA proposed on the LWCF site is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and RFFAs proposed in this area, would include increased noise from construction equipment, increased traffic, and potential delays for users and/or detours during construction actions. Long-term cumulative effects on management actions of this LWCF site are not anticipated.

Yampa River Recreation Area Land and Water Conservation Fund Site

The percentage of the Project in the Yampa River Recreation Area LWCF site would be less than 1 percent as the Project would span the site; consequently, no permanent infrastructure would affect the site. Past and present actions on the LWCF site include:

- oil and/or gas lease activity on Colorado state land and the BLM Little Snake Field Office
- 20-inch and 24-inch diameter pipeline owned by El Paso Corporation
- 36-inch diameter pipeline owned by Kinder Morgan Inc.
- 14-inch diameter pipeline owned by ONEOK Inc.
- 10-inch diameter pipeline owned by Plains All American GP LLC
- 6-inch diameter pipeline owned by Source Gas LLC
- Hayden to Artesia 138kV transmission line
- Bears Ears to Bonanza 345kV transmission line
- Craig to Rifle 345kV transmission line
- D&RGW Railroad

- U.S. Route Highway 40
- Colorado State Highway 13 and 318
- County Roads 143, 17, 181, 19, 23, 25, 53 and 74

The RFFA proposed on the site is the TransWest Express Transmission Project. The short-term cumulative effects of the Project crossing the LWCF site, in addition to the past and present actions and the RFFA occurring on the LWCF site, potentially would limit and/or hinder access and increase noise during construction of the projects. The long-term cumulative effects would be the presence of an additional transmission line spanning LWCF site.

Bitterbrush State Wildlife Area

The percentage of the Project in the Bitterbrush SWA would be less than 1 percent as the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the Bitterbrush SWA include the Hayden to Artesia 138kV transmission line, Bears Ears to Bonanza 345kV transmission line, a 20-inch and 24-inch diameter pipelines and U.S. Highway 40, and County Highway 57, 143, 59. The RFFA proposed in the SWA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the SWA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the SWA are not anticipated.

Tuttle Ranch Conservation Easement

The percentage of the Project in the Tuttle Ranch Conservation Easement would be less than 1 percent. Past and present actions that occur in the Tuttle Ranch Conservation Easement include:

- oil and/or gas leases in the BLM Little Snake Field Office and on Colorado state lands
- Bears Ears to Bonanza 345kV transmission line
- Hayden to Artesia 138kV transmission line
- U.S. Highway 40
- County Road 14C

The RFFA proposed for Tuttle Ranch Conservation Easement is TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement, which goes against the terms of the conservation easement.

Cross Mountain Ranch Conservation Easement

The percentage of the Project in the Cross Mountain Ranch Conservation Easement would be less than 1 percent. Past and present actions that occur in the Cross Mountain Ranch Conservation Easement include:

- oil and/or gas leases on Colorado state lands
- 10-inch diameter pipeline owned by Plains All American GP LLC
- range improvement projects completed by the BLM White River Field Office
- Bears Ears to Bonanza 345kV transmission line
- Hayden to Artesia 138kV transmission line
- US Highway 40 and County roads 14, 143, 14A, 14B, 14C, 23, and 85

The RFFA proposed for Cross Mountain Ranch Conservation Easement is TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement, which goes against the terms of the conservation easement.

4.3.15.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Past and present actions and RFFAs in special designation and other management areas crossed by the COUT BAX alternative routes are presented in Table 4-125, and the potential cumulative effects are discussed for each special designation and other management area below.

Effects

Piceance/East Douglas Wild Horse Herd Management Area

The percentage of the Project in the Piceance/East Douglas WHHMA would be less than 1 percent. Past and present actions in the WHHMA include:

- oil and/or gas leases in the BLM White River Field Office
- Shell Frontier Oil and Gas, Incorporated oil shale research, development, and demonstration project
- 20-inch diameter pipeline owned by El Paso Corporation
- 36-inch diameter pipeline owned by Kinder Morgan Inc.
- 14-inch diameter pipeline owned by Questar Corporation
- 26-inch, 24-inch, 10-inch, and 8-inch diameter pipeline owned by Williams Companies Inc.
- 8-inch and 6-inch diameter pipeline owned by Xcel Energy Inc.
- Rangely to Meeker 138kV transmission line
- County Highway 5, 100, 103, 107, 108, 122, 128, 138, 20, 20A, 24, 24X, 27, 28, 68, 88, 89, and 91
- Colorado Highway 64E and 139
- range improvement projects managed and prescribed by the BLM White River Field Office

The RFFA proposed in the WHHMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and other RFFAs proposed in this area, would be increased noise from construction equipment, limited access to a portion of the WHHMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the WHHMA are not anticipated.

Big Hole Rock Art Site Area of Critical Environmental Concern

The percentage of the Project located in the Big Hole Rock Art Site ACEC would be less than 1 percent. Because the Project would span the ACEC, no permanent infrastructure would affect the ACEC. There is the Huntington to Pinto 345kV transmission line and no RFFAs in the ACEC. The cumulative effects of the Project crossing the ACEC would be the same as direct and indirect impacts described in Section 3.2.14 and Section 3.2.20.

TABLE 4-125
SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado										
Piceance/East Douglas Wild Horse Herd Management Area	Bureau of Land Management (BLM) White River Field Office	To provide habitat for between 135 and 235 wild horses	All COUT BAX	189,835	11,698	26	11	11,735	178,100	<1
Utah										
Big Hole Rock Art Site Area of Critical Environmental Concern	BLM Price Field Office	To protect Big Hole Rock Art site	COUT BAX-B	649	6	0	4	10	639	<1
North Moroni Conservation Easement	Utah Division of Wildlife Resources (UDWR)	To protect crucial deer and elk winter range	COUT BAX-B, COUT BAX-C	1,003	108	15	9	131	871	<1
Fountain Green Wildlife Management Area (WMA)	Utah Reclamation Mitigation and Conservation Commission (URMCC) and UDWR	To reserve forage for big game so to prevent them from feeding on adjacent farms and to improve upland game habitat.	COUT BAX-B, COUT BAX-C	4,004	167	0	1	168	3,836	<1
Gordon Creek WMA	UDWR	To protect critical big game winter range	COUT BAX-E	19,091	943	279	9	1,232	17,859	<1

TABLE 4-125
SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Name	Managing Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Salt Creek WMA	UDWR	To protect important nesting, resting, and feeding habitat for waterfowl	All COUT BAX	2,078	59	36	15	110	1,968	<1
Crawford Farm Conservation Easement	UDWR	Designated to protect Columbia spotted frog habitat and to prevent any uses that may harm natural open space and ranching conditions on the property	COUT-H	75	45	0	2	47	28	<1
Nuttall Farm Conservation Easement	UDWR	Designated to retain natural, scenic, wetland, and agricultural conditions and to prevent any use from affecting the conservation values of the property, including Columbia spotted frog species, as well as the southern leatherside chub and rare native fish	COUT-H	71	25	0	0	25	46	0

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

North Moroni Conservation Easement

The percentage of the Project in the North Moroni Conservation Easement would be less than 1 percent. Past and present actions that occur in the North Moroni Conservation Easement include active oil and/or gas leases on SITLA-managed land, Jerusalem to Nebo 138kV transmission line, and Mona to Huntington 345kV transmission line. The RFFA proposed in the North Moroni Conservation Easement is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement.

Fountain Green Wildlife Management Area

The percentage of the Project in the Fountain Green WMA would be less than 1 percent. Past and present actions that occur in the WMA include historic fires and active oil and/or gas leases on SITLA-managed land. There is no RFFA proposed on Fountain Green WMA. The short-term cumulative effects of the Project, in addition to past and present actions would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WMA are not anticipated.

Gordon Creek Wildlife Management Area

The percentage of the Project in the Gordon Creek WMA would be less than 1 percent as the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the WMA include historic fires, active oil and/or gas leases managed by BLM Price Field Office and SITLA, a 20-inch diameter pipeline owned by Questar Corporation, the Spanish Fork to Emery 345kV and Spanish Fork to Huntington 345kV transmission lines. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Salt Creek Wildlife Management Area

The percentage of the Project in the Salt Creek WMA would be less than 1 percent. Past and present actions that occur in the WMA include active oil and/or gas leases on SITLA-managed lands; and the Jerusalem to Nebo 138kV transmission line, Mona to Bonanza 345kV transmission line, and Mona to Huntington 345kV transmission line. The RFFA proposed in the WMA is TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on waterfowl management actions in the WMA are not anticipated.

Crawford Farms Conservation Easement

The percentage of the Project in the Crawford Farms Conservation Easement would be less than 1 percent. There are no past or present actions or RFFAs that occur in the Crawford Farms Conservation

Easement. The short-term and long-term cumulative effects of the Project on these easements would be the same as those documented in Section 3.2.15.

Nuttall Farms Conservation Easement

The percentage of the Project in the Nuttall Farms Conservation Easement would be zero. There are no past or present actions or RFFAs that occur in the Nuttall Farms Conservation Easement. The short-term and long-term cumulative effects of the Project on these easements would be the same as those documented in Section 3.2.15.

4.3.15.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Past and present actions and RFFAs in special designation and other management areas crossed by the COUT alternative routes are presented in Table 4-126, and the potential cumulative effects are discussed for each special designation and other management area below.

Effects

Lower Green River Corridor Area of Critical Environmental Concern

The percentage of the Project in the Lower Green River Corridor ACEC would be less than 1 percent. This ACEC also includes a portion of the Lower Green River Suitable WSR (described below). Past and present actions that occur in the ACEC include:

- gilsonite mining on the eastern side of the river
- active oil and or gas and metalliferous mineral leases on SITLA-managed lands
- Active oil and or gas units in the Vernal Field Office
- Gasco Energy, Inc. Uinta natural gas development
- Bill Barrett Corporation West Tavaputs Plateau oil and/or gas development
- 20-inch diameter existing Questar pipeline

RFFAs proposed or planned in the ACEC include:

- TransWest Express Transmission Project
- Newfield’s Monument Butte oil and/or gas development

The short-term cumulative effects of the Project, in addition to past and present actions and RFFAs proposed in this area, would be increased noise from construction equipment and limited access to a portion of the ACEC during construction actions of the projects. Long-term cumulative effects on the management of riparian habitat in this ACEC are not anticipated. Cumulative effects for Lower Green River Corridor ACEC regarding scenery are discussed in Section 4.3.18.

TABLE 4-126
SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Name	Management Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Colorado										
There are no special designations or other management areas crossed in Colorado for the COUT alternative routes.										
Utah										
Lower Green River Corridor Area of Critical Environmental Concern	Bureau of Land Management Vernal Field Office	To protect riparian habitat and scenery	COUT-C, COUT-H, COUT-I	9,347	734	38	14	786	8,561	<1
Crawford Farm Conservation Easement	Utah Division of Wildlife Resources (UDWR)	Designated to protect Columbia spotted frog habitat and to prevent any uses that may harm natural open space and ranching conditions on the property	COUT-H	75	45	0	2	47	28	<1
Nuttall Farm Conservation Easement	UDWR	Designated to retain natural, scenic, wetland, and agricultural conditions and to prevent any use from affecting the conservation values of the property, including Columbia spotted frog species, as well as the southern leatherside chub and rare native fish	COUT-H	71	25	0	0	25	46	0

TABLE 4-126
SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Name	Management Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Sandwash/Sinkdraw Conservation Easement	UDWR	Designated to protect, grasslands, open space, crucial wintering areas for big game, sage grouse habitat, and other natural characteristics of the property	COUT-A	11,866	873	234	61	1,168	10,698	<1
North Moroni Conservation Easement	UDWR	To protect crucial deer and elk winter range	COUT-I	1,003	880	108	15	132	871	<1
The Utah Reclamation Mitigation and Conservation Commission (URMCC) Property (adjacent to: Tabby Mountain and Currant Creek Wildlife Management Areas [WMA])	URMCC	Acquired as mitigation for the Central Utah Project (a water development project)	COUT-A	16,550	1,313	60	48	1,421	15,129	<1
Birdseye WMA	UDWR	To protect big game winter range and threatened Deseret milkvetch populations	COUT-A, COUT-B, COUT-C	927	34	38	19	91	908	<1
Lake Fork WMA				2,734	15	17	13	44	2,721	<1

TABLE 4-126
SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Name	Management Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Cottonwood WMA	UDWR	To protect big game winter range and to increase public access in an area of predominately private land	COUT-B	6,749	241	49	12	302	6,447	<1
Currant Creek WMA	UDWR	Acquired as mitigation for wildlife habitat loss for the Central Utah Project, has angler access and aquatic/ terrestrial habitat protection	COUT-A	21,403	919	109	41	1,069	20,334	<1
Dairy Fork WMA	UDWR	To protect and enhance mule deer and elk winter range	COUT-A, COUT-B, COUT-C	5,076	74	59	34	167	4,909	<1
Fountain Green WMA	URMCC and UDWR	To reserve forage for big game so to prevent them from feeding on adjacent farms and to improve upland game habitat.	COUT-I	4,004	167	0	1	168	3,836	<1
Gordon Creek WMA	UDWR	To protect critical big game winter range	COUT-H	19,091	943	279	9	1,232	17,859	<1
Rabbit Gulch WMA	UDWR	To protect important nesting, resting, and feeding habitat for waterfowl	COUT-A	9.194	767	93	58	918	8,276	<1

TABLE 4-126
SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Name	Management Agency	Management Values	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
					Past and Present Development	Reasonably Foreseeable Future Actions				
Salt Creek WMA	URMCC and UDWR	To protect critical big game winter range	All COUT	2,078	59	36	18	113	1,964	<1
Spencer Fork WMA	UDWR	To protect big game winter range	COUT-A, COUT-B, COUT-C	6,192	137	112	71	321	5,872	<1
Starvation WMA	UDWR	To protect and enhance mule deer and elk winter range	COUT-B, COUT-C	8,089	295	24	12	331	7,757	<1
Tabby Mountain WMA	URMCC and UDWR	To protect critical winter range for big game	COUT-A	8,127	340	113	19	472	7,655	<1

NOTE: Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total.

North Moroni Conservation Easement

The percentage of the Project in the North Moroni Conservation Easement would be less than 1 percent. Past and present actions that occur in the North Moroni Conservation Easement include active oil and/or gas leases on SITLA-managed lands and the Jerusalem to Nebo 138kV transmission line and Mona to Huntington 345kV transmission line. The RFFA proposed for North Moroni Conservation Easement is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement.

Crawford Farms Conservation Easement

The percentage of the Project in the Crawford Farms Conservation Easement would be less than 1 percent. There are no past or present actions or RFFAs that occur in the Crawford Farms Conservation Easement. The short-term and long-term cumulative effects of the Project on these easements would be the same as those documented in Section 4.3.15.

Nuttall Farms Conservation Easement

The percentage of the Project in the Nuttall Farms Conservation Easement would be zero. There are no past or present actions or RFFAs that occur in the Nuttall Farms Conservation Easement. The short-term and long-term cumulative effects of the Project on these easements would be the same as those documented in Section 4.3.15.

Sandwash/Sinkdraw Conservation Easement

The percentage of the Project in the Sandwash/Sinkdraw Conservation Easement would be less than 1 percent. Past and present actions that occur in the Sandwash/Sinkdraw Conservation Easement include the Blacktail Ridge Exploratory Drill Project, active oil and/or gas leases on SITLA-managed lands, Arch View Ranchettes, Cedar Mountain #9, Tabby Shadows, Vista Valley, West Star Properties, Mona to Bonanaza 345kV transmission line, and Utah State Route 208. The RFFA proposed for Sandwash/Sinkdraw Conservation Easement is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects would include additional industrial development in the conservation easement.

Utah Reclamation Mitigation and Conservation Commission Lands

The percentage of the Project located on URMCC-managed lands would be less than 1 percent. There are no past and present actions or RFFAs directly related to these lands but past and present actions and RFFAs are in the WMAs associated with these lands. The cumulative effects related to the URMCC-managed lands are discussed in more detail for the Currant Creek and Tabby Mountain WMAs below.

Birdseye/Lake Fork Wildlife Management Areas

The percentage of the Project in the Birdseye/Lake Fork WMAs would be less than 1 percent as the Project right-of-way is located in an area that has past and present actions and RFFAs. Past and present actions that occur in the WMA include active oil and/or gas leases located on SITLA-administered land

and the Mona to Bonanza 345kV transmission line. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on big game and threatened Desert milkvetch management actions in the WMA in are not anticipated.

Cottonwood Canyon Wildlife Management Area

The percentage of the Project in the Cottonwood Canyon WMA would be less than 1 percent because the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the WMA include the Lake Canyon oil and or gas project, oil leases on Utah state lands, Upalco to Panther 138kV transmission line, and the Sliver Moon residential unit. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Currant Creek Wildlife Management Area

The percentage of the Project in the Currant Creek WMA would be less than 1 percent. Past and present actions that occur in the WMA include Sundown Ridge residential development, Mona to Bonanza 345kV transmission line, the Bill Barrett Lake Canyon Oil and/or Gas Project, vegetation treatments in the BLM Vernal Field Office, and U.S. Highway 40. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the WMA are not anticipated.

Dairy Fork Wildlife Management Area

The percentage of the Project in the Dairy Fork WMA would be less than 1 percent. Past and present projects actions that occur in the WMA include the D&RGW Railway, Spanish Fork to Carbon 138kV transmission line, and Mona to Bonanza 345kV transmission line present actions that occur in the WMA. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on elk and mule deer management actions in the WMA are not anticipated.

Fountain Green Wildlife Management Area

The percentage of the Project in the Fountain Green WMA would be less than 1 percent. Past and present actions that occur in the WMA include historic fires and active oil and/or gas leases on SITLA-managed lands. There are no RFFA proposed in the WMA. The short-term cumulative effects of the Project, in addition to past and present actions would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on management actions in the WMA are not anticipated.

Gordon Creek Wildlife Management Area

The percentage of the Project in the Gordon Creek WMA would be less than 1 percent as the Project right-of-way is located in an area that has past and present actions and an RFFA. Past and present actions that occur in the WMA include active oil and/or gas leases managed by BLM Price Field Office and SITLA, 20-inch diameter pipeline owned by Questar Corporation, Spanish Fork to Emery 345kV transmission line and Spanish Fork to Huntington 345kV transmission line. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Rabbit Gulch Wildlife Management Area

The percentage of the Project in the Rabbit Gulch WMA would be less than 1 percent. Past and present actions that occur in the WMA include habitat projects in the Vernal Field Office, Bill Barrett Corporation Blacktail Ridge oil and/or gas project, active oil and/or gas development and oil development on Utah state land, Cedar Mountain #8 and #9 residential developments, Great Basin Estates I residential development, River Heights residential development, a private residential development, and Mona to Bonanza 345kV transmission project. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance to the lands in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Salt Creek Wildlife Management Area

The percentage of the Project in the Salt Creek WMA would be less than 1 percent. Past and present actions that occur in the WMA include active oil and/or gas leases on SITLA-managed lands, Jerusalem to Nebo 138kV transmission line, Mona to Bonanza 345kV transmission line, and Mona to Huntington 345kV transmission line. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on waterfowl management actions in the WMA are not anticipated.

Spencer Fork Wildlife Management Area

The percentage of the Project in the Spencer Fork WMA would be less than 1 percent. Past and present actions that occur in the WMA include historic fires, 18-inch diameter pipeline owned by the Questar Corporation, Mona to Bonanza 345kV transmission line, and D&RGW Railroad. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on big game management actions in the WMA are not anticipated.

Starvation Wildlife Management Area

The percentage of the Project in the Starvation WMA would be less than 1 percent as the Project right-of-way is located in an area that has a past and present action and an RFFA. Past and present actions that occur in the WMA include U.S. Highway 6, D&RGW Railway, Spanish Fork to Carbon 138kV transmission line, Spanish Fork to Emery 345kV transmission line, and Spanish Fork to Huntington 345kV transmission line. The RFFA proposed in the WMA is the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and an RFFA proposed in this area, would include increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on mule deer and elk habitat management actions in the WMA are not anticipated.

Tabby Mountain Wildlife Management Area

The percentage of the Project in the Tabby Mountain WMA would be less than 1 percent. Past and present actions that occur in the WMA include Mona to Bonanza 345kV transmission line, Utah State Route 208, Bill Barrett Corporation Blacktail Ridge oil and/or gas development and habitat management actions managed by the BLM Vernal Field Office. RFFAs proposed or planned in the WMA are the TransWest Express Transmission Project. The short-term cumulative effects of the Project, in addition to past and present actions and RFFAs proposed or planned in this area, would be increased noise from construction equipment, limited access to a portion of the WMA during construction actions of the projects, and disturbance of land in the right-of-way. Long-term cumulative effects on management actions in the WMA are not anticipated.

4.3.16 Lands with Wilderness Characteristics

The approach for analysis of cumulative effects on lands with wilderness characteristics, including the geographic and temporal scopes defined for analysis is presented in Table 4-3. The cumulative effects on wilderness areas and WSAs are not discussed in this section. This analysis relies on the results of direct impacts from the Project (refer to Section 4.3.16) and considers them in conjunction with the past, present, and reasonably foreseeable future developments listed in Tables 4-1 and 4-2.

4.3.16.1 Issues Identified for Analysis

4.3.16.1.1 Potential Impacts on the Wilderness Characteristics or Management of Lands with Wilderness Characteristics

Potential conflicts include adversely impacting the wilderness characteristics for which a unit was considered for future wilderness designation (e.g., disrupting the apparent naturalness of the environment, etc.). These conflicts would be intensified where the Project and other future and/or existing activities are occurring in the same unit.

4.3.16.2 Existing Condition

Past and present actions occur on almost all units in the geographic scope. This includes lands with wilderness characteristics in the BLM Rawlins, Grand Junction, Little Snake, Moab, Price, Vernal, and White River field offices. Some past and present actions such as recreational infrastructure, oil and/or gas development, roads, pipelines, transmission lines, etc. may have been inventoried in a unit, but the actions were found to be compatible with the wilderness characteristics for which the units were inventoried.

4.3.16.3 Results

4.3.16.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Potential cumulative effects from past and present actions and RFFAs on lands with wilderness characteristics crossed by the WYCO alternative routes, are summarized below by unit.

Lands with Wilderness Characteristics in the BLM Rawlins Field Office

Rotten Springs Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been minimally influenced by past and present development with existing pipelines in the BLM Rawlins Field Office designated utility corridor and minimal oil and gas exploration on BLM lands. The introduction of the Project (Alternative WYCO-C) and the proposed TransWest Express Transmission Project would affect the wilderness characteristics along the eastern portion of Rotten Springs; however, the remaining area would be intact. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

Lands with Wilderness Characteristics in the BLM Little Snake Field Office

Anthill Draw Unit

Wilderness characteristics for this portion of the unit (refer to Section 3.2.16) have been minimally influenced by past and present development with roads, oil and gas infrastructure disturbing a greater amount of the eastern portion of the unit, and potential oil and gas development on Colorado State Land Board lease. The introduction of the Project along all WYCO alternative routes and the proposed TransWest Express Transmission Project would affect the wilderness characteristics along the northwestern portion of Anthill Draw; however, the remaining area would be intact. Opportunities for solitude would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

Deep Canyon Unit

Wilderness characteristics for this portion of the unit (refer to Section 3.2.16) have been minimally influenced by past and present development with only one road in the northern portion and vegetation treatments conducted by the BLM Little Snake Field Office in the southern and eastern portion of the inventory area. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Transmission Project would affect the wilderness characteristics along the western portion of Deep Canyon unit; however, the remaining portion of the unit would be intact. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

West Sevenmile Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been minimally influenced by past and present development including vegetation treatments conducted by the BLM Little Snake Field Office, and potential oil and gas development on Colorado State Land Board leases. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Project would affect the wilderness characteristics along the eastern portion of the unit; however the remaining portion of the unit would be intact. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

Upper Little Snake Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been minimally influenced by past and present development with just one road that crosses the northern portion of the unit. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Transmission Project would affect the wilderness characteristics by bisecting the western portion of the unit; however, the remaining eastern portion (more than 5,000 acres) would be intact. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

Simsberry Draw Unit

Wilderness characteristics for this unit have been minimally influenced by past and present development with vegetation treatments conducted by the BLM Little Snake Field Office and potential oil and gas development on Colorado State Land Board leases. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Transmission Project would affect these characteristics since the transmission line projects would bisect this unit on Godiva Rim. Due the prominence of Godiva Rim, these projects would be skylined and further influence opportunities for solitude and primitive recreation in this area. Because the two proposed transmission line projects would bisect the unit, the resulting areas would be less than the 5000-acre threshold for the size criteria for lands with wilderness characteristics.

Spence Gulch Unit

Wilderness characteristics for this unit have been minimally influenced by past and present development with a road that crosses the northern portion, vegetation treatments conducted by the BLM Little Snake Field Office in the western portion, and potential oil and gas development on Colorado State Land Board leases in the southern edge of the unit. The introduction of the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F) and the proposed TransWest Express Transmission Project would not affect these wilderness characteristics since the transmission line projects would be on the southern corner of the unit. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

Lands with Wilderness Characteristics in the BLM White River Field Office

Lower Wolf Creek Unit

Wilderness characteristics for this portion of the unit (refer to Section 3.2.16) have been minimally influenced by past and present development with a road that would cross into the eastern portion of the unit and a 10-inch diameter pipeline owned by Plains All American GP, LLC that crosses the northwestern portion of the unit. The introduction of the Project (all WYCO alternative routes) and the proposed TransWest Express Transmission Project would not affect the wilderness characteristics along the northwestern edge of Lower Wolf Creek unit since the majority of the unit would remain intact. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

4.3.16.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Potential cumulative effects from past and present actions and RFFAs in lands with wilderness characteristics units crossed by the COUT BAX alternative routes are summarized below by unit.

Lands with Wilderness Characteristics in BLM White River Field Office

Coal Ridge Unit

Wilderness characteristics for the Coal Ridge unit (refer to Section 3.2.16) have been minimally influenced by past and present development with a few scattered roads and historic fire boundaries . The introduction of the Project (all COUT BAX alternative routes) and the proposed TransWest Express Transmission Project would influence wilderness characteristics along the western edge of Coal Ridge. However, topographic screening offered by Coal Ridge would reduce the effects of the Project on the wilderness characteristics of the core of the unit.

Gilsonite Hills Unit

Wilderness characteristics for this unit have been minimally influenced by past and present development, including roads and potential oil and gas development on the BLM White River Field Office leases adjacent to the area and a series of pipelines that form the southern boundary and influence wilderness characteristics in the unit. The introduction of the Project (all COUT BAX alternative routes) along the eastern edge of the Gilsonite Hills area would further influence and begin to affect the wilderness characteristics of the unit, while effects on the core of the unit would be limited due to the topographic screening offered by the highly dissected terrain. The proposed TransWest Express Transmission Project would not traverse this unit. Effects on the wilderness characteristics could be reduced if the Project was located east of Dragon Road rather than crossing the road twice and traversing the unit.

Wild Rose Unit

Wilderness characteristics for the Wild Rose unit have been minimally influenced by past and present development with a few roads and potential oil and gas development on the BLM White River Field Office leases in the area. If developed, oil and gas activities could begin to affect the wilderness characteristics of this unit. The introduction of the Project (all COUT BAX alternative routes) and the proposed TransWest Express Transmission Project along the western edge of this unit would further influence and begin to affect the wilderness characteristics of the area.

Bluejay Creek Unit

Wilderness characteristics for this unit have been influenced by past and present development with oil and gas pads located at the end of cherry-stemmed roads and a series of pipelines that form the southern boundary of the unit. The BLM White River Field Office has leased areas for oil and gas development adjacent to the northeast and southwest edges of the Bluejay Creek unit. If developed, oil and gas activities could begin to affect the local area. The introduction of the Project (all COUT BAX alternative routes) and the proposed TransWest Express Transmission Project along the northwestern edge of this unit would further influence and begin to affect the wilderness characteristics of the unit.

Whiskey Creek Unit

Wilderness characteristics for this unit have been influenced by past and present development with a series of pipelines that form the eastern boundary of the unit and encroach on the boundary of the unit. The BLM White River Field Office has leased areas for oil and gas development adjacent to the northern and western edges of this unit. If developed, oil and gas activities could influence the wilderness characteristics of the unit. The introduction of the Project (all COUT BAX alternative routes) along the western edge of this unit would further influence and begin to affect the wilderness characteristics of the area. The proposed TransWest Express Transmission Project would not traverse Whiskey Creek.

Lower Wolf Creek Unit

Wilderness characteristics for this portion of the unit (refer to Section 3.2.16) have been minimally influenced by past and present development with a road that would cross into the eastern portion of the unit and a 10-inch diameter pipeline owned by Plains All American GP, LLC that crosses the northwestern portion of the unit. The introduction of the Project (All COUT BAX alternative routes) and the proposed TransWest Express Transmission Project would not affect the wilderness characteristics along the northwestern edge of Lower Wolf Creek remaining portion of the unit since the majority of the unit would remain intact. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

Lands with Wilderness Characteristics in the BLM Grand Junction Field Office

Spring Canyon Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been influenced by past and present development with a series of pipelines that form the western boundary of this unit and a number of cherry-stemmed roads that influence opportunities for solitude and primitive recreation even though the roads are not in the boundary of the unit. The BLM Grand Junction Field Office has leased areas for oil and gas development on several parcels in Spring Canyon. If developed, oil and gas activities could influence the wilderness characteristics of the unit. The introduction of the Project (all COUT BAX alternative routes) and the proposed TransWest Express Transmission Project along the western edge of this unit would further influence and begin to affect wilderness characteristics of the unit.

Lands with Wilderness Characteristics in BLM Moab Field Office

Harley Dome Unit

Wilderness characteristics for the Harley Dome unit (refer to Section 3.2.16) have been minimally influenced by past and present development with I-70 adjacent to the southeastern boundary of the unit and potential oil and gas development on SITLA leases along the northern boundary of the unit. The introduction of the Project (all COUT BAX alternative routes) and the proposed TransWest Express Transmission Project along the southeastern boundary of the unit would further influence and begin to affect the wilderness characteristics of the unit. Due to limited screening opportunities, the influence of these projects would extend further into the core of the unit.

Floy Canyon Unit

Wilderness characteristics for this unit have been minimally influenced by past and present development with I-70, the D&RGW Railroad, and an existing power line adjacent to the southern boundary of the unit. The BLM Moab Field Office has leased this entire area for oil and gas development. If developed, oil and gas activities could affect the wilderness characteristics of this area. The introduction of the Project (all COUT BAX alternative routes) and the proposed TransWest Express Transmission Project in the area south of Hatch Mesa would further influence wilderness characteristics, where wilderness characteristics are not as intact as the area north of Hatch Mesa.

Lands with Wilderness Characteristics in BLM Price Field Office

Desolation Canyon Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been minimally influenced by past and present development along the periphery, with U.S. Highway 6, the D&RGW Railroad, and an existing 138kV transmission line adjacent to the western boundary of the unit. Additionally, potential oil and gas development on SITLA leases adjacent to the southeast and northwest portions of this unit and the Horse Canyon Coal Mine – Lila Canyon Tract (which is most of the northern portion of the unit) could influence wilderness characteristics in the unit. Due to limited screening opportunities, the introduction of the Project (Alternatives COUT BAX-C, and COUT BAX-E) along the western portion of this unit would further influence and begin to affect the area that would extend the influence of the Project further into the core of the unit. The proposed TransWest Express Transmission Project would not traverse this unit.

Never Sweat Wash Unit

Wilderness characteristics for this unit have been minimally influenced by past and present development with the Green River Cutoff Road that separates Never Sweat Wash from the Lost Spring Wash unit, and potential oil and gas development on SITLA leases on lands in the unit's boundary. The introduction of the Project (Alternative COUT BAX-C), the proposed TransWest Express Transmission Project, and the Woodside potential geothermal development site would affect the wilderness characteristics adjacent to Green River Cutoff Road and areas where views of these proposed projects would limit opportunities for solitude and primitive recreation in the core of the unit.

Lost Spring Wash Unit

Wilderness characteristics for this unit have been minimally influenced by past and present development with the Green River Cutoff Road that separates Lost Spring Wash from the Never Sweat Wash unit, oil and gas development on SITLA leases on lands in the unit, and an existing 345kV transmission line adjacent to the southwest edge of the unit. The introduction of the Project (all COUT BAX alternative routes), the proposed TransWest Express Transmission Project, and the Woodside potential geothermal development site would affect the wilderness characteristics adjacent to the Green River Cutoff Road (Alternatives COUT BAX-C and COUT BAX-E), and to a lesser degree along Cottonwood Wash (Alternative COUT BAX-B), as well as in areas where views of these proposed projects would limit opportunities for solitude and primitive recreation.

Price River Unit

Wilderness characteristics for this unit have been minimally influenced by past and present development with potential oil and gas development on SITLA leases. The introduction of the Project (Alternative COUT BAX-E) and the proposed TransWest Express Transmission Project would influence wilderness characteristics along the northern edge of this unit, but there would be limited effects on these wilderness characteristics in the core of this unit due to topographical screening offered by the canyon walls adjacent to the Price River.

4.3.16.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Potential cumulative effects from past and present actions and RFFAs in lands with wilderness characteristics units crossed by the COUT alternative routes are summarized below by unit.

Lands with Wilderness Characteristics in BLM Vernal Field Office

Desolation Canyon Unit

Wilderness characteristics for this inventoried area (refer to Section 3.2.16) have been influenced by past and present development with a pipelines located along the northern edge of the unit and extensive oil and gas development adjacent to and within the northern boundary of the unit. Cherry-stem roads cross through the entire unit. There are no other proposed projects in this unit. The introduction of the Project (COUT-C, COUT-H, and COUT-I alternative routes) in addition to the existing development in the unit would minimally affect the unit.

Desolation Canyon Addition Unit

Similar to the Desolation Canyon unit, wilderness characteristics for this unit (refer to Section 3.2.16) have been influenced by past and present development with a pipelines located along the northern edge of the unit and extensive oil and gas development adjacent to and within the unit. There are no other proposed projects in this unit. Due to the existing development, the introduction of the Project (COUT-C, COUT-H, and COUT-I alternative routes) would minimally increase the existing impacts within the unit.

Badlands Cliffs Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been influenced by past and present development with an extensive oil and gas lease by Gasco Company that is adjacent to and covers the entire unit and pipelines located along the northern edge of the unit, with cherry-stem roads in the eastern portion of the unit. There are no other proposed projects in this unit. Due to the existing development, the Project (COUT-C, COUT-H, and COUT-I alternative routes) would minimally increase the existing impacts within the unit.

Currant Canyon Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been influenced by past and present development with the eastern portion of the unit leased by the Gasco Company for oil and gas development and cherry-stem roads crossing into the southern portion of the unit. There are no other proposed projects in this unit. Due to the existing development, the introduction of the Project (COUT-C, COUT-H, and COUT-I alternative routes) would minimally increase the existing impacts within the unit.

Lands with Wilderness Characteristics in BLM White River Field Office

Coal Oil Gulch Unit

Wilderness characteristics for this unit (refer to Section 3.2.16) have been minimally influenced by past and present development with a historic fire, two existing transmission lines located approximately 1,000 feet north of the area and extensive oil and gas development adjacent to the southern boundary. The introduction of the Project (all COUT alternative routes) and the proposed TransWest Express Transmission Project along the northern portion of the unit would further influence wilderness characteristics. Since these projects are located in proximity to existing development, wilderness characteristics in the core of the unit would be minimally affected.

Lower Wolf Creek Unit

Wilderness characteristics for this portion of the unit (refer to Section 3.2.16) have been minimally influenced by past and present development with a road that would cross into the eastern portion of the unit and a 10-inch diameter pipeline owned by Plains All American GP, LLC that crosses the northwestern portion of the unit. The introduction of the Project (All COUT alternative routes) and the proposed TransWest Express Transmission Project would not affect the wilderness characteristics along the northwestern edge of Lower Wolf Creek remaining portion of the unit since the majority of the unit would remain intact. Opportunities for solitude and apparent naturalness would be influenced further in the unit by these projects due to the vertical prominence of the transmission line towers.

4.3.17 Inventoried Roadless Areas and Unroaded/Undeveloped Areas

The approach for analysis of cumulative effects on IRAs and unroaded/undeveloped areas units, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the identified direct and indirect impacts from the Project (refer to Section 3.2.17) on IRAs and unroaded/undeveloped areas and considers these impacts in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.17.1 Issues Identified for Analysis

4.3.17.1.1 Potential Impacts on Inventoried Roadless Areas and Unroaded/Undeveloped Areas

Potential impacts of the Project on IRAs and unroaded and undeveloped areas include the potential inability of the USFS to continue to manage these areas for the wilderness attributes and roadless characteristics for which they were originally designated.

4.3.17.2 Existing Condition

The existing conditions in each of these areas are discussed in Section 3.2.17. No IRAs or unroaded/undeveloped areas in Wyoming or Colorado are in the alternative route study corridors.

These wilderness and roadless values have been influenced by past and present actions, including recreational infrastructure, oil and/or gas development, roads, pipelines, and transmission lines. These modifications, in general, are compatible with the values identified for each IRA and unroaded/undeveloped area. Many of the areas where land has been leased for oil and/or gas development have not yet been constructed; therefore, the existing condition may appear more natural than would be present after the development of these approved projects.

4.3.17.3 Results

4.3.17.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

There are no IRAs or unroaded/undeveloped areas crossed by the WYCO alternative routes.

4.3.17.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Past and present actions and RFFAs potentially crossing IRAs and unroaded and undeveloped areas also crossed by the COUT BAX alternative routes are presented in Table 4-127. IRAs and/or unroaded/undeveloped areas are not analyzed for Colorado because none of these areas are crossed by alternative routes considered for the Project.

Effects

The following summarizes the effects of past and present actions and RFFAs for each IRA and unroaded/undeveloped area crossed by the Project.

TABLE 4-127
INVENTORIED ROADLESS AND UNROADED/UNDEVELOPED AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Unit Name and Type	Alternative Route	Total Available Resource	No Action Alternative: Past and Present Development	No Action Alternative: Reasonably Foreseeable Future Actions	Incremental Project Development[1]	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
Utah								
Manti-La Sal National Forest								
East Mountain Unroaded/ Undeveloped Area	COUT BAX-B, COUT BAX-C	28,303	10,250	0	0	10,250	18,053	36.2
Oak Creek Unroaded/ Undeveloped Area	COUT BAX-E	5,359	7	0	24	31	5,328	0.6
San Pitch Mountains Unroaded/Undeveloped Area	All COUT BAX	21,681	2	0	0	2	21,679	0.1

NOTES:

[1] To avoid overestimating impacts when the Project right-of-way overlaps past and present activities or other reasonably foreseeable future actions (RFFA). A zero incremental project development is assumed.

Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total. There is potential for overlap between the Project right-of-way, past and present development, and RFFA columns.

Manti-La Sal National Forest

Inventoried Roadless Areas

No IRAs are crossed by the COUT BAX alternative routes in the Manti-La Sal National Forest.

Unroaded/Undeveloped Areas

East Mountain Unroaded/Undeveloped Area

Wilderness values for this area influenced by past and present development include:

- areas leased for oil and/or gas development in the BLM Richfield and Price Field Offices
- Ferron Natural Gas Project
- Deer Creek Coal Lease
- an existing 345kV transmission line that parallels the southwestern boundary of the area.

Since the majority of development is associated with leases that have not yet been explored, there are limited modifications present in the unroaded/undeveloped area but when developed, these activities may affect opportunities for solitude and primitive recreation opportunities in this area. The Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Project would further influence these wilderness values through the introduction of transmission structures and right-of-way vegetation clearing along the western boundary of this unroaded/undeveloped area.

Oak Creek Unroaded/Undeveloped Area

Wilderness values in this area have been minimally influenced by development. Since there are no other planned future activities in this area, effects on these values resulting from the Project (Alternative COUT BAX-E) would be the same as those described in Chapter 3, including the short-term impacts on natural processes and views dominated by the Project from the Maple Fork Trail.

San Pitch Mountains Unroaded/Undeveloped Area

Wilderness values for this area influenced by past and present development include an existing 138kV transmission line that crosses the northern boundary of the area

Wilderness values in this area have been minimally influenced by development except for the existing transmission line that crosses the northern boundary of the IRA for approximately 500 feet. Since there are no other planned future activities in this area, effects on these values resulting from the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) would be the same as those described in Chapter 3.

4.3.17.3.3 Colorado to Utah – U.S. Highway 40 to Clover (COUT)

Current projects and other RFFAs potentially crossing IRAs and/or unroaded/undeveloped areas also crossed by the COUT alternative routes are presented in Table 4-128 and are discussed by national forest (Ashley, Manti-La Sal, and Uinta) for each alternative route. There are no IRAs or unroaded/undeveloped areas analyzed for Colorado because none of these areas are crossed by the Project.

TABLE 4-128
INVENTORIED ROADLESS AND UNROADED/UNDEVELOPED AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Unit Name and Type	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development[1]	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
			Past and Present Development	Reasonably Foreseeable Future Actions				
Utah								
Ashley National Forest								
0401010 Inventoried Roadless Area	COUT-B	21,635	1,075	262	0	1,337	20,298	6.2
0401011 Inventoried Roadless Area	COUT-B	30,039	1,227	0	0	1,227	28,812	4.1
Cottonwood Unroaded/ Undeveloped Area	COUT-B	25,989	925	0	0	925	25,064	3.6
Sowers Canyon Unroaded/ Undeveloped Area	COUT-B	17,028	862	239	0	1,101	15,927	6.5
Manti-La Sal National Forest								
Cedar Knoll Inventoried Roadless Area	COUT-A, COUT-B, and COUT-C	22,485	7	9	6	22	22,463	0.1
Cedar Knoll Unroaded/ Undeveloped Area	COUT-A, COUT-B	28,351	6	12	6	24	28,327	0.1
	COUT-C		6	12	6	24	28,327	0.1
East Mountain Unroaded/ Undeveloped Area	COUT-I	28,303	10,250	0	0	10,250	18,054	36.2
Oak Creek Unroaded/ Undeveloped Area	COUT-H	5,359	7	0	26	33	5,326	0.6

TABLE 4-128
INVENTORIED ROADLESS AND UNROADED/UNDEVELOPED AREAS CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CLOVER (COUT) ALTERNATIVE ROUTES IN ACRES

Unit Name and Type	Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development[1]	Estimated Cumulative Development	Remaining Available Resource	Percent of Project Impact
			Past and Present Development	Reasonably Foreseeable Future Actions				
Uinta-Wasatch-Cache National Forest								
Chipman Creek (418008) Inventoried Roadless Area	COUT-A	9,360	91	138	0	229	9,131	2.4
Willow Creek (418009) Inventoried Roadless Area	COUT-A	18,049	176	1	0	177	17,872	1.0

NOTES:
[1] To avoid overestimating impacts when the Project right-of-way overlaps past and present activities or other reasonably foreseeable future actions (RFFA). A zero incremental project development is assumed.
Acreages are approximate and have been rounded to the nearest acre; therefore, the columns may not total. There is potential for overlap between the Project right-of-way, Past and Present, and RFFA columns

Effects

The following summarizes the past and present actions and RFFAs for each IRA and unroaded/undeveloped area crossed by the COUT alternative routes.

Ashley National Forest

Inventoried Roadless Area

IRA 0401010

Wilderness and roadless values for this area influenced by past and present development include:

- Berry Petroleum South Unit oil and/or gas project
- oil and/or gas leases administered by the BLM Vernal Field Office
- existing 138kV transmission line paralleling the northwest boundary of the IRA

Since these oil and gas projects are leased areas, which have not been developed to date, there are limited modifications present in the IRA; but when developed, these activities may affect opportunities for solitude and primitive recreation opportunities in this area. The introduction of the Project (Alternative COUT-B) and the TransWest Express Project would further influence these values along the northwestern boundary of the IRA adjacent to Sowers Canyon Road.

IRA 0401011

Wilderness and roadless values for this area influenced by past and present development include:

- Berry Petroleum South Unit oil and/or gas project
- oil and/or gas leases administered by the BLM Vernal Field Office
- an existing 138kV transmission line paralleling the southeast boundary of the IRA

Similar to the discussion for IRA 0401010, since the majority of these actions are leases that have not been developed, there are limited existing modifications present in the IRA. Through the introduction of the Project (Alternative COUT-B) and the TransWest Express Project, these values would be further influenced by development adjacent to Sowers Canyon Road along the southeast boundary of the IRA.

Unroaded/Undeveloped Areas

Cottonwood Unroaded/Undeveloped Area

Wilderness values for this area influenced by past and present development include:

- Berry Petroleum South Unit oil and/or gas project
- oil and/or gas leases administered by the BLM Vernal Field Office
- existing 138kV transmission line paralleling the northwest boundary of the area

Since these oil and gas projects are leased areas, which have not been developed to date, there are limited modifications present in the area but when developed, these activities may affect opportunities for solitude and primitive recreation opportunities in this area. The introduction of the Project (Alternative COUT-B) and the TransWest Express Project would further influence these values along the southeastern boundary of the area adjacent to Sowers Canyon Road.

Sowers Canyon East Unroaded/Undeveloped Area

Wilderness values for this area influenced by past and present development include:

- the Berry Petroleum South Unit oil and/or gas project
- oil and/or gas leases administered by the BLM Vernal Field Office
- existing 138kV transmission line paralleling the southeast boundary of the area

Similar to the discussion for the Cottonwood Unroaded/Undeveloped Area, since the majority of these actions are leases that have not been developed, there are limited existing modifications present in the area. Through the introduction of the Project (Alternative COUT-B) and the TransWest Express Project, these values would be further influenced by development adjacent to Sowers Canyon Road along the western boundary of the area.

Manti-La Sal National Forest

Inventoried Roadless Areas

Cedar Knoll IRA

Wilderness and roadless values for this area have been influenced by active SITLA-administered oil and/or gas leases and an existing 345kV transmission line adjacent to the western boundary of the IRA, which also crosses the area for a short distance. Through the introduction of the Project (Alternatives COUT-A, COUT-B, and COUT-C) and the TransWest Express Project, which both cross the boundary of this area, would affect roadless and wilderness values along the western ridge of the IRA in proximity to the existing 345kV transmission line. Opportunities for solitude and primitive recreation would be influenced by these projects in an area with limited existing recreation opportunities.

Unroaded/Undeveloped Areas

Cedar Knoll Unroaded/Undeveloped Area

Wilderness values for this area have been influenced by active SITLA-administered oil and/or gas leases and an existing 345kV transmission line adjacent to the western boundary of the area. The introduction of the Project (Alternatives COUT-A, COUT-B, and COUT-C) and the TransWest Express Project, which both cross the boundary of this area, would affect wilderness values along the southwest corner of the unroaded/undeveloped area in proximity to the existing 345kV transmission line. Opportunities for solitude and primitive recreation would be influenced by these projects in an area with limited existing recreation opportunities.

East Mountain Unroaded/Undeveloped Area

Wilderness values for this area influenced by past and present development include:

- areas leased for oil and gas development in the BLM Richfield and BLM Price Field Offices
- Ferron Natural Gas Project
- Deer Creek Coal Lease
- existing 345kV transmission line that parallels the southwestern boundary of the area

Since the majority of this development is associated with leases that have not yet been developed, there are limited modifications present in the unroaded/undeveloped area but when developed, these activities may affect opportunities for solitude and primitive recreation opportunities in this area. The introduction of the Project (Alternatives COUT-I) and the TransWest Express Project would further influence these wilderness values through the introduction of transmission structures and right-of-way vegetation clearing along the western boundary of this unroaded/undeveloped area.

Oak Creek Unroaded/Undeveloped Area

Wilderness values in this area have been minimally influenced by development. Since there are no other planned future activities in this area, effects on these values resulting from the Project (Alternative COUT-H) would be the same as those described in Chapter 3, including the short-term impacts on natural processes and views dominated by the Project from the Maple Fork Trail.

San Pitch Mountains Unroaded/Undeveloped Area

Wilderness values for this area influenced by past and present development include an existing 138kV transmission line that crosses the northern boundary of the area

Wilderness values in this area have been minimally influenced by development except for the existing transmission line that crosses the northern boundary of the IRA for approximately 500 feet. Since there are no other planned future activities in this area, effects on these values resulting from the Project (Alternatives COUT-A, COUT-B, COUT-C, COUT-H, and COUT-I) would be the same as those described in Chapter 3.

Uinta-Wasatch-Cache National Forest

Inventoried Roadless Areas

Chipman Creek IRA (418008)

Wilderness and roadless values in the IRA have been minimally influenced by past and present development except for an existing 345kV transmission line that forms the southern boundary of the area and influences opportunities for solitude and primitive recreation along the southern edge of the IRA. The introduction of the Project (Alternative COUT-A) and the TransWest Express Project would increase modifications adjacent to the IRA; but through micro-siting of towers, the IRA could be spanned to minimize effects on these values.

Willow Creek IRA (418009)

Wilderness and roadless values in the IRA have been influenced by past and present development along the northern boundary of the area where an existing 345kV transmission line traverses the IRA, including more than 20 transmission structures and associated right-of-way vegetation clearing. The introduction of the Project (Alternative COUT-A) and the TransWest Express Project would be further influenced these values by the presence of additional transmission lines; but since only the right-of-way for these projects would traverse the IRA, there would be minimal effects on these values.

Unroaded/Undeveloped Areas

There are no unroaded/undeveloped areas crossed by the COUT alternative routes in the Uinta-Wasatch-Cache National Forest.

4.3.18 Visual Resources

Cumulative effects in context with visual resources would result from the incremental impacts on scenery and the viewsheds associated with public viewing areas based on the construction and operation of the Project in context with past and present actions and RFFAs. The incremental impacts on these landscapes and viewsheds would result from changes to the existing landform through earthwork including road construction, alteration of existing vegetation patterns due to vegetation management, and the introduction of man-made structures that typically would be incongruent or similar with existing features that define landscape character. The approach for analysis of cumulative effects on visual resources, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the assessment of impacts from the Project (refer to Section 3.2.18) in relation to the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

Cumulative effects for visual resources were evaluated and characterized in context with one, or a combination of, the three types of effects: (1) additive – the effects of the actions add together to make up the cumulative effect, (2) countervailing – the effects of some actions balance or mitigate the effects of other actions, and (3) synergistic – the effects of the actions together is greater than the sum of their individual effects (BLM 2008b). In general for visual resources in context with transmission line projects, if the Project is colocated with other existing or future linear projects, cumulative effects are additive because the form, line, color, and texture of the features of the facilities (i.e., access roads, earthwork, and facilities) are similar and form a cohesive, united feature in the landscape. If new projects are located outside the context of existing corridors, landscapes (i.e., SQRUs) would be further divided and the cumulative effect becomes strongly synergistic. In terms of effects on views, the larger corridor could be more dominant based on site-specific viewing conditions, separation of facilities, and other elements. However, if the projects are sited in context with existing transmission lines and they are similar in scale, form, line, color, and texture, the cumulative effect would be reduced due to the cohesive relationship of the Project’s features.

4.3.18.1 Issues Identified for Analysis

4.3.18.1.1 Scenery

As described in Section 3.2.18, scenery is defined as a continuous unit of land comprised of harmonizing features that result in and exhibit a distinct landscape character. A cumulative effect on scenery would result from the industrialization of natural appearing landscapes through the construction of multiple projects and the alteration of the existing landscape’s characteristics, including landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification. In general, those areas where transmission line projects would be colocated such that they are visually related, effects would be reduced. Matching spans to the extent practicable and sharing construction and maintenance access roads would further reduce cumulative effects of such projects. In forested areas where projects would have a limited visual relationship with one another, or the projects deviate from using the same corridor, cumulative effects generally increase as the landscape become more fragmented; thus, the industrial nature of transmission line projects would have a stronger effect on landscape character.

4.3.18.1.2 Views

Viewing locations represent places where the public would have the potential to view the Project and typically include residences, travel routes, recreation areas, and special designations. Cumulative effects would occur where viewers would perceive the alteration of the landscape components of landform, vegetation, and structure through the introduction of the Project in addition to existing disturbances and RFFAs. Multiple transmission lines and/or other energy facilities (e.g., wind farms, natural gas wells, etc.) seen in context with the Project would dominate views from viewing locations with moderate to high concern for changes in the landscape. Generally, the dominance of the aggregation of a project is reduced when the project features are visually similar (i.e., transmission lines seen in context with other transmission lines). Inversely, if the aggregate of the projects are incongruent (i.e., a mixture of natural gas wells with transmission lines and other modifications), cumulative effects are greater.

4.3.18.2 Existing Condition

Residential and industrial development in general has altered the existing landscape character associated with scenic quality rating units (refer to Maps 3-9a and 3-9b for SQRUs crossed by the Project) and views from identified viewing locations throughout the Project study area. Below is a summary of the major areas of development in each state traversed by the Project.

Throughout the Wyoming portion of the Project area, industrial development, primarily associated with oil and gas production, dominates the existing landscape character. In particular, the area between the I-80 corridor and the Wyoming/Colorado border has extensive oil and gas development that has resulted in visual alterations that are codominant with the natural landscape features. Few existing transmission lines occur in this area except for an existing 230kV transmission line connecting Hanna and Rock Springs, which has similar design characteristics as the Project; but due to the scale of the existing transmission line, it does not dominate the existing natural landscape features.

In Colorado, existing development primarily is located along Colorado State Highway 13 and U.S. Highway 40, and is associated with rural, dispersed residences and agricultural development, which are generally subordinate to the natural landscape features. South of Rangely toward Baxter Pass, numerous areas of oil and gas development are located along Rio Blanco County Road 23 and along the floor of West Salt Creek Canyon south of Baxter Pass, which begin to dominate the natural landscape features. Several existing transmission lines with similar design characteristics as the Project, run from the Craig Power Station, adjacent to U.S. Highway 40, to the Colorado/Utah border south of the community of Dinosaur and begin to dominate the natural landscape features.

Oil and gas development has modified and is codominant with the landscape character in several areas in Utah including the Uinta Basin, Castle Valley, and northwest of Cisco. There are three existing 345kV transmission lines corridors with similar design characteristics as the Project located adjacent to Project alternative routes including: (1) from Green River through the San Rafael Swell and over the Wasatch Plateau to Mona, (2) from the Utah/Colorado border through the Uinta Basin and Uinta-Wasatch-Cache National Forest to Mona, and (3) two lines from the Huntington Power Station to Spanish Fork Canyon, which each locally dominate the natural landscape features.

In addition to the existing 345kV transmission lines, several smaller 138kV transmission lines occur adjacent to Project alternative routes including parallel to U.S. Highway 6 between Green River and Price, from Sowers Canyon through Argyle and Willow Creek canyons to the Carbon Power Station, Spanish Fork Canyon, and from the Bonanza Power Station to the community of Vernal. These lower-voltage transmission lines have similar design characteristics as the Project, except they are smaller in scale; and as such, they influence but do not dominate the existing natural landscape features. Several power plants are located adjacent to the Project alternative routes, including the Bonanza, Huntington, and Carbon power plants that dominate the local landscape character and influence adjacent views. In addition to these industrial modifications, dispersed residences and agricultural development have modified the existing landscape character in the Uinta Basin, Castle Valley, Sanpete Valley, and Juab Valley but generally are subordinate to the natural landscape features.

4.3.18.3 Results

4.3.18.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Scenery

Table 4-129 lists the cumulative effects for the WYCO alternative routes.

TABLE 4-129
SCENERY CUMULATIVE EFFECTS SUMMARY FOR THE
WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource[1]	Percent of Scenery Units not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
WYCO-B (Agency and Applicant Preferred Alternative)	4,929,600	3,315,000	486,800	3,200	3,805,000	1,124,600	23
WYCO-C	4,929,900	3,316,400	487,600	3,500	3,807,400	1,122,400	23
WYCO-D	5,038,100	3,641,400	331,100	14,700	3,987,200	1,050,900	21
WYCO-F	4,850,400	3,377,200	459,400	3,300	3,840,000	1,010,400	21

NOTES:
[1] Area of scenery units not influenced by development
Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Issue Areas

Scenery issues, as described in the direct Project effects discussion in Chapter 3, include the following landscapes (SQRUs):

- Adobe Town Region
- Little Snake River Valley
- Yampa River

In addition, through the analysis of cumulative effects on scenery, the Great Divide, Juniper Mountain, and Routt SQRUs were identified as landscapes where the Project's influence includes many areas not influenced by past, present, or other future actions.

Effects

Due to the large amount of existing industrial development, including expansive oil and gas fields, many of the landscapes north and east of Flat Top Mountain in the BLM Rawlins Field Office have been influenced visually by these landscape modifications. South of Flat Top Mountain to U.S. Highway 40, the TransWest Express Transmission Project primarily would modify the same landscapes that would be influenced by the Project. Therefore, if the TransWest Express Transmission Project and the Project were not colocated, these two projects would influence additional areas; whereas, being colocated would consolidate the areas of modification. As such, many landscapes (SQRUs) would be completely influenced by past, present, and future projects, as analyzed, including: Atlantic Rim, Bolton Ranch, Cedar Breaks, Continental Divide, Creston, Delaney Rim, Doty Mountain, Fortification Rocks, Muddy Creek, Platte North, Rawlins/Sinclair, Red Rim, Sage Creek, and The Sand Hills. It is important to note that Alternative WYCO-D would influence approximately an additional 10,000 acres when compared to other WYCO alternative routes. This distinction is primarily a result of the TransWest Express Transmission Project alternative route in this area not being colocated with the Project south of Baggs, Wyoming. To reduce cumulative effects in this area, the two transmission projects should be colocated to the extent practicable.

Adobe Town Region

The Adobe Town SQRU has approximately 30 percent of its area influenced by existing development, including oil and gas development as well as several existing pipelines located adjacent to the alignment of Alternative WYCO-C. These elements have introduced landscape character deviations through modification of the landscape's landforms and vegetation patterns, in particular, the geometric features associated with the existing pipeline rights-of-way. In addition to the structures associated with existing oil and gas development, the TransWest Express Transmission Project would introduce transmission line structures adjacent to the proposed alignment for Alternative WYCO-C through this landscape. As such, only Alternative WYCO-C would extend the influence of development further into the western portion of the Adobe Town Region by approximately 300 acres.

Little Snake River Valley

The area around Baggs, Wyoming, known as the Little Snake (River) Valley, has been influenced by existing development including several pipelines, adjacent oil and gas development, and widespread dispersed residences that have modified the existing character of the landscape. It is important to note the presence of dispersed residences in this valley produces a strong rural character that has been minimally influenced by industrial development. The introduction of the TransWest Express Transmission Project into this landscape would produce a more industrialized landscape character, which if Alternative WYCO-D, and to a lesser degree Alternative WYCO-F, were chosen would extend this area of development. This industrialization would be produced by the introduction of transmission line structures, clearing of vegetation in the rights-of-way, and the development of construction access roads that would modify the existing landscape's form, line, color, and texture. To reduce cumulative effects on the character of this landscape, potential mitigation would include colocation of the two transmission projects to the extent practicable.

Yampa River

The Yampa River is represented by several landscape units as delineated by the BLM Little Snake Field Office through their SQRU inventory. These include, from east to west, the Yampa River Valley/Hayden, Duffy Valley, Juniper Hot Springs, Juniper Mountain (northern edge), Maybell, and Cross Mountain Canyon. The eastern portion of the Yampa River traversed by Alternative WYCO-D, Yampa River Valley/Hayden, has been influenced by the development around Craig, Colorado, including the Trapper Mine, Craig Power Plant, and multiple existing transmission lines and pipelines. Due to the extent of the existing development that has industrialized this area, as well as future development including the expansion of the Trapper Mine and the TransWest Express Transmission line, the Project would have minimal additional influence on this landscape's character. The next three portions of the Yampa River (Duffy Valley, Juniper Hot Springs, and Juniper Mountain) also are associated with Alternative WYCO-D where the Project would parallel multiple existing transmission lines as well as an alternative for the TransWest Express Transmission Project. In addition, an area of permitted oil and gas wells along the western portion of the Duffy Valley landscape would further modify the character of this landscape. The next portion of the Yampa River, the Maybell landscape, would be crossed by Alternatives WYCO-B, WYCO-C, and WYCO-F with Alternative WYCO-D located approximately 0.5 mile away. The portion of the Maybell landscape crossed by Alternatives WYCO-B, WYCO-C, and WYCO-F has been minimally influenced by an existing pipeline and residences, but through the addition of the

TransWest Express Transmission Project, would become more industrialized. Due to the Project and the TransWest Express Transmission Project being colocated in this area, the Project would not increase the influence of the development in this landscape but would produce more intense cumulative effects. Alternative WYCO-D cross the Maybell landscape adjacent to multiple transmission lines in an area influenced by U.S. Highway 40 and dispersed residences. The final portion of the Yampa River in the study area, Cross Mountain Canyon, has been influenced minimally by existing development. Since the TransWest Express Transmission Project has an alternative route approximately 1.25 miles away from this landscape; whereas Alternatives WYCO-B, WYCO-C, and WYCO-F would be located approximately 2.5 miles away and the Project would have minimal additional influence on this landscape.

Great Divide

The landscape known as the Great Divide, between Sevenmile Ridge and the Elkhead Mountains, has been influenced visually by existing oil and gas development located in the northern and southern portions of the landscape, a network of pipelines in the central and eastern portion of the landscape, and transmission lines along the southern edge. The remaining portions of the landscape have minimal influence from development and have a more intact landscape character. Through the development of RFFAs, including the TransWest Express Project, this landscape would begin locally to become industrialized in nature. The Project would have varying levels of influence on the industrialization of this landscape based on the alternative route selected. Alternatives WYCO-B, WYCO-C, and WYCO-F would have limited additional influence on the Great Divide due to colocation with the TransWest Express Project. Alternative WYCO-D would increase industrialized of this landscape adjacent to the Wyoming-Colorado border where the TransWest Express Project follows a different alignment, expanding the area viewed as modified from the presence of transmission line structures, right-of-way vegetation clearing, and the construction of access roads.

Juniper Mountain

The Juniper Mountain SQRU, located southeast of Maybell, Colorado, has been visually influenced by a series of pipelines along the western edge of this landscape as well as rural development and existing transmission lines adjacent the Yampa River at the landscape's northern edge. Through the development of RFFAs, including the TransWest Express Project, the area viewed as modified by transmission lines would be expanded further to the south due to separation between this proposed project and the existing transmission lines. The addition of the Project (Alternative WYCO-D), located south of the existing transmission lines and the TransWest Express Project, would continue the increasing modification of this landscape through expanding utility development adjacent to U.S. Highway 40.

Routt

The Routt SQRU, primarily associated with lands east of Colorado State Highway 13 in the Medicine Bow-Routt National Forest, has been visually influenced by scattered oil and gas development, residential development (Wilderness Ranch) in the northern portion of the landscape, and development along the Colorado State Highway 13 corridor including a series of pipelines and dispersed residences. The limited nature of the activities leaves the majority of the landscape with an intact landscape character. Through the development of RFFAs, including the TransWest Express Project, this landscape would begin locally to appear industrialized adjacent to Colorado State Highway 13. The addition of the Project (Alternative WYCO-D) would increase the industrialization of this area in particular where the Project and TransWest Express Project would not be colocated, resulting in an expansion of the area viewed as modified through the presence of transmission line structures, right-of-way vegetation clearing, and the construction of access roads.

Viewing Locations

Views from identified viewing locations would have a range of cumulative effects resulting from the addition of the Project in context with past, present, and future actions; and to focus on the key issues, the analysis focuses on the seven simulation locations identified in Table 4-130 along the WYCO alternative routes.

TABLE 4-130
CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE WYOMING TO COLORADO – AEOLUS TO U.S. HIGHWAY 40 (WYCO) ALTERNATIVE ROUTES

Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Route
52[1]	Dispersed residences southwest of Craig	WYCO-D
66[1]	Dispersed residence along Colorado State Highway 13	WYCO-D
150	Dinosaur National Monument (Deerlodge Road)	All WYCO
197[1]	Hanna residential	WYCO-D
220	North Platte River Special Recreation Management Area	All WYCO
225	Outlaw Trail Loop Scenic Drive (Wyoming Highway 789 north of Baggs)	WYCO-D
299	East Cross Mountain River Access	All WYCO

NOTES:
[1] Cumulative effects simulation not prepared since neither the TransWest Express Transmission Project or Gateway West 500kV Transmission Project would be visible in the area of the direct effects simulation
Cumulative simulations are located in Appendix M.

Key Observation Point Number 52 – Dispersed residences southwest of Craig (simulation)

Views from these dispersed residences have already been modified as a result of existing transmission lines, development around Craig, and potentially through development of oil and gas lease areas. While not shown in the simulation, the Craig power plant is visible from this location when looking toward the southeast, which has an even greater influence on views for residences located farther to the east. These existing modifications have introduced several industrial structures that begin to dominate views from these residences. Through the addition of the Project (Alternative WYCO-D), which has similar design characteristics to the existing transmission lines, as well as the TransWest Express Transmission Project, these views would be completely dominated by industrial development which due to the separation between these two transmission line projects in this area, would extend the area viewed as modified. To reduce this visible expansion of industrial development, potential mitigation would be to site the two transmission projects as close to the existing transmission line as practicable.

Key Observation Point Number 66 – Dispersed Residence along Colorado State Highway 13

Due to the limited extent of existing development in this area, including dispersed residential development and minor pipelines, views have been modified minimally by development. Through the introduction of the Project (Alternative WYCO-D) and the TransWest Express Transmission Project, views from dispersed residences along Colorado State Highway 13 would begin to be dominated by transmission lines. It is important to note that as currently designed, the TransWest Express Transmission Project would not be visible in the simulation as it is located on the west side of Colorado State Highway 13. This separation between the two proposed transmission lines would place residences between both projects, as well as Colorado State Highway 13, which would create a tunnel-effect and dominate views from these locations. To reduce the cumulative effect on these views, potential mitigation would include colocation of the two projects to the extent practicable.

Key Observation Point Number 150 – Dinosaur National Monument (Deerlodge Road)

Views from the recreation kiosk on Deerlodge Road, in Dinosaur National Monument, have been influenced by existing transmission lines and U.S. Highway 40, located southeast of the kiosk. Existing development begins to dominate views from this location, in particular U.S. Highway 40, which is located adjacent to this viewpoint. Through the introduction of the Project (all WYCO alternative routes) as well as the TransWest Express Project (southern option), the area viewed as influenced by development would be similar to the existing condition with more intense levels of modification due to the presence of two new transmission line projects. The introduction of other TransWest Express Project alternative routes would expand this area of modification farther to the north where views from Deerlodge Road would become locally dominated by industrial development. Cumulative effects associated with other Project route variations are discussed in Appendix F.

Key Observation Point Number 197 – Hanna Residential

Views from residences in this portion of Hanna have views influenced by existing transmission lines and development south of Hanna. Due to the scale of the existing transmission lines and construction materials (wood), these features do not dominate views from Hanna. With the addition of the Project (Alternative WYCO-D), views would begin to be dominated by transmission line structures toward the west, in particular the Project’s skylined transmission structures. Note that the Gateway West 500kV Transmission Project does not have a colocated route in this area.

Key Observation Point Number 220 – North Platte River Special Recreation Management Area (simulation)

Views from the North Platte River SRMA have been minimally modified by development except for I-80, located 1.25 miles north of this viewpoint, and the series of pipelines, which are screened from view at this location. These existing modifications are more dominant where viewers are located directly adjacent to these areas, but in general, views from in this recreation area are intact. Through the introduction of the Project (all WYCO alternative routes) as well as the Gateway West 500kV Transmission Project, views would become dominated by transmission lines, which may include transmission structures skylined on ridges that would further dominate views as shown in the cumulative effects simulation. To reduce the cumulative effect of these projects on views from the North Platte River SRMA, these two projects should be colocated in an area where they could be screened partially by topography, which would minimize their perceived dominance on views.

Key Observation Point Number 225 – Outlaw Trail Loop Scenic Drive (WY 789 north of Baggs) (simulation)

Motorists on this county-designated scenic drive have long duration views of existing oil and gas development as well as areas leased for oil and gas development. From the simulation location, these modifications are not readily apparent; but through the expansion of future oil and gas leases areas as well as the introduction of the Project (Alternative WYCO-D) and the TransWest Express Transmission Project, views along this scenic drive would become dominated by industrial development. In particular, the introduction of transmission and oil and gas-related structures, that due to proximity to the road, may be skylined, and would further increase their dominance on these views as shown in the cumulative effects simulation. To reduce cumulative effects, potential mitigation would include colocation of the two transmission projects as far from this scenic road as practicable. Views from the scenic drive of Alternative WYCO-F would be similar to the description for Alternative WYCO-D except the Project would be located approximately 2.5 miles away in a location where views of the Project would be screened partially to fully by topography. It is important to note the other WYCO alternative routes cross the scenic drive farther to the north, adjacent to I-80, in an area that is dominated by existing and planned future oil and gas development. Since the scenic drive would not be paralleled by the Project on those alternative routes, the additional cumulative effect introduced by the Project on those alternative routes would be minimal.

Key Observation Point Number 299 – East Cross Mountain River Access (simulation)

Views from this recreation area, specifically access to the site, generally are intact with few existing cultural modifications. Both the Project (Alternatives WYCO-B, WYCO-C, and WYCO-F as well as one alternative route for the TransWest Express Transmission Project would be located nearly 3 miles away from this viewpoint with a portion of each of these two projects screened by topography. A series of transmission structures, associated with the Project and the TransWest Express Transmission Project, would be skylined on the distant ridgeline and, therefore, influence but not dominate views from this area as shown in the cumulative effects simulation.

4.3.18.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Scenery

Table 4-131 lists the cumulative effects for the COUT BAX alternative routes.

TABLE 4-131
SCENERY CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES IN ACRES

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource[1]	Percent of Scenery Units not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
COUT BAX-B	4,909,100	3,299,800	386,900	8,500	3,695,200	1,213,800	25
COUT BAX-C	4,924,000	3,287,700	41,000	8,400	3,715,100	1,209,000	25
COUT BAX-E	5,103,500	3,418,400	426,000	9,000	3,853,300	1,250,200	24

NOTES:
[1] Area of scenery units not influenced by development
Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Issue Areas

Scenery issues, as described in the direct Project effects discussion in Chapter 3, include the following landscapes (SQRUs):

- Book Cliffs
- Grand Valley
- Tavaputs Plateau
- Wasatch Plateau Alpine
- Wasatch Plateau
- Wasatch Plateau Parks landscape

In addition, through the analysis of cumulative effects on scenery, the Big Horse Draw, Coal Ridge, and Douglas Pass SQRUs were identified as landscapes where the Project’s influence includes many areas not influenced by past, present, or other future actions.

Effects

Due to the presence of existing development and proposed future development, including but not limited to the TransWest Express Transmission Project, there are locations where entire scenery units would be influenced by past, present, and future projects. As analyzed, these landscapes (SQRUs) include Cedar Mountain, Education Creek, Hadden Hills/Oil Well Dome, and Prickly Pear Flat. In particular, Education Creek has been influenced by multiple pipelines that traverse this narrow landscape. The other three landscapes are located in the northern portion of the San Rafael Swell and have been influenced by permitted oil and gas development on SITLA-administered land, existing transmission lines, and future energy production areas (Woodside site, Blue Castle Nuclear Power Plant, and a proposed wind facility on Cedar Mountain).

Big Horse Draw

The arid juniper hills southwest of Rangely were identified as the Big Horse Draw SQRU by the BLM White River Field Office. The majority of this landscape has been influenced by past, present, and future projects including areas of existing and permitted oil and gas development, several existing pipelines, and a proposed alternative route for the TransWest Express Transmission Project. Due to the separation between the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) and the TransWest Express Transmission Project, additional areas (approximately 2.5 percent of the SQRU area) would be influenced visually by the Project where past, present, or future projects would not have a visual influence.

Book Cliffs

The area known as the Book Cliffs is made up of several smaller SQRUs including the Book Cliffs (BLM Grand Junction Field Office), Demaree WSA (BLM Grand Junction Field Office), Book Cliffs Bench (BLM Moab Field Office), and Green River/Book Cliffs (BLM Price Field Office). In the location where the Project would cross through the Book Cliffs in Colorado (along the edge of the Book Cliffs and Demaree WSA landscapes), the scenery has been influenced by existing oil and gas development and a series of existing pipelines. This area would be influenced further by industrial development as a result of the TransWest Express Transmission Project, which would be located adjacent to Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E. Additional areas influenced by the presence of the Project would be minimal; but due to the narrow canyon traversing through the Book Cliffs, where both of these transmission line projects would be located, these projects should be colocated to the extent practicable to avoid crossing steep slopes on the canyon walls.

In Utah, the landscapes associated with the Book Cliffs (Book Cliffs Bench and Green River/Book Cliffs SQRUs) would not be crossed by the Project but are located in the area that would be influenced by the Project. Due to the location of existing modifications, including Utah SITLA-administered oil and gas leases and underground coal mining, as well as future actions including the Woodside site, Blue Castle Nuclear Power Plant, and the TransWest Express Transmission Project, the Project would influence few areas not already influenced by these past and future projects. Through the cumulative development of all of these projects, the Book Cliffs would be located adjacent to increasingly industrialized landscapes.

Coal Ridge

The landscape associated with Coal Ridge has been influenced visually by existing transmission lines along the northern boundary and development adjacent to the White River south of the landscape. The remaining portion of this landscape has been minimally altered by development and has a more intact landscape character. Through the development of RFFAs, including the TransWest Express Project, this landscape would be crossed and more directly influenced by development leading to the industrialization of the area adjacent to this proposed transmission line project. Introduction of the Project (all COUT BAX alternative routes) and the separation between these transmission line projects would lead to an intensification of the industrialization of the western portion of Coal Ridge due to the presence of transmission line structures, right-of-way vegetation clearing, and the construction of access roads.

Douglas Pass

Located between Douglas Pass and Baxter Pass (including the upper portion of Baxter Pass) this SQRU, as delineated by the BLM White River Field Office, includes areas of existing and permitted oil and gas development, communication facilities, and multiple pipelines located along both the east and west edge of this landscape, which have visually influenced approximately half of the scenery unit. Similar to the Big Horse Draw SQRU discussion, the separation between the Project and the TransWest Express Transmission Project would produce areas that would only be influenced by the presence of the Project.

Grand Valley

This valley includes the communities of Fruita and Grand Junction as well as the surrounding agricultural fields. Due to the extensive existing development located in the valley, which also includes several existing transmission lines, pipelines, and I-70; the Project (Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E) would minimally influence this landscape.

Tavaputs Plateau

The area known as the Tavaputs Plateau, or more specifically the East Tavaputs Plateau, is made up of several smaller SQRUs as delineated by the BLM White River and Grand Junction Field Offices including Baxter Pass, Big Horse Draw (previously discussed), Bitter Creek Canyon, Canyon Pintado, Douglas Pass (previously discussed), Education Creek, Oil Springs WSA, Park Mountain/Park Canyon, Rabbit Mountain, Rat Hole Ridge/Achee Uplands, Spring Creek, and Upper Bitter Creek/Bitter Creek. These landscapes have been modified by development, including several pipelines as well as existing and permitted oil and gas wells. In addition to the existing modifications in these landscapes, the Project would parallel the proposed TransWest Express Transmission Project along Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E. The addition of the Project along with these past, present, and future projects would modify the existing landforms and vegetation patterns present in these landscapes as well as introduce a series of industrial structures associated with the two proposed transmission line projects and expanding oil and gas fields.

Wasatch Plateau Alpine

This scenery unit was digitized to represent the western ridgeline of the Wasatch Plateau above the community of Mount Pleasant. Other than an existing transmission line that crosses the ridge, there are few existing landscape character modifications. The majority of this area has been leased by the BLM Richfield Field Office for oil and gas development, which would further modify the landscape character. The addition of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project would begin to industrialize the area above Potters Pond through the presence of transmission line structures, access roads, and geometric right-of-way vegetation clearing. To reduce cumulative effects on this narrow scenery unit, the two proposed transmission lines should be located as close as practicable to the existing transmission line.

Wasatch Plateau

The scenery unit that comprises the northern portion of the Wasatch Plateau covers a large portion of the Manti-La Sal National Forest from U.S. Highway 6 to Joes Valley Reservoir. As such, there are areas of more intense existing development and areas with limited landscape character modifications. Existing modifications include surface facilities associated with underground coal mining, existing transmission lines and pipelines, and areas leased for oil and gas development. With the addition of the TransWest Express Transmission Project into this scenery unit, the Project along Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E would visually influence a small area that has not already been influenced by past, present, or future actions including the TransWest Express Transmission Project. The presence of the Project, including the transmission line structures, access roads, and right-of-way vegetation clearing, would produce a more intense localized cumulative effect on scenery if the Project were colocated with the TransWest Express Transmission Project and the existing transmission line along Alternatives COUT BAX-B and COUT BAX-C. Whereas, if the Project and the TransWest Express Transmission Project were not colocated, there would be a more diffuse but widespread cumulative effect on the Wasatch Plateau landscape in context with other past, present, and future actions.

Wasatch Plateau Parks Landscape

There are two park landscapes located on the Wasatch Plateau with the area known as Scad Valley, which would be crossed by Alternatives COUT BAX-B and COUT BAX-C, and the park adjacent to Gooseberry Creek (Gooseberry Creek valley), which would be crossed by Alternative COUT BAX-E. Scad Valley has few existing cultural modifications except for the presence of an existing transmission line; but through development of oil and gas leased areas as well as coal lease areas, this landscape has the potential to become industrialized. In addition to the past and present development in Scad Valley, the introduction of the Project and the TransWest Express Transmission Project would further industrialize the southern portion of this landscape unit through the presence of transmission line structures, access roads, and right-of-way vegetation clearing. The other park landscape, Gooseberry Creek Valley, has fewer existing landscape character deviations than Scad Valley, except for areas leased for oil and gas areas development along the eastern edge of this scenery unit. An existing pipeline is located along the northern edge of the landscape that has modified the local character through geometric right-of-way vegetation clearing. Future development including industrial facilities associated with the Narrows Dam and Reservoir, TransWest Express Transmission Project, and the Project would further modify the landscape character through the introduction of industrial structures, access roads, and vegetation clearing.

Viewing Locations

Views from identified viewing locations would have a range of cumulative effects resulting from the addition of the Project in context with past, present, and future actions; and to focus on the key issues, this analysis will focus on the 24 simulation locations identified in Table 4-132 along the COUT BAX alternative routes.

TABLE 4-132
CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Route
32	Cedar Mountain Overlook (San Rafael Swell)	COUT BAX-B, COUT BAX-C
41[1]	Dinosaur Diamond Scenic Byway (U.S. Highway 6)	COUT BAX-C, COUT BAX-E
152	Interstate 70 (I-70) Harley Dome Rest Area (Dinosaur Diamond Scenic Byway)	All COUT BAX
193	I-70 Crescent Junction Rest Stop (Dinosaur Diamond Scenic Byway)	All COUT BAX
195	Indian Creek Campground	COUT BAX-B, COUT BAX-C

TABLE 4-132
CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO BAXTER PASS TO CLOVER (COUT BAX) ALTERNATIVE ROUTES

Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Route
217[1]	Skyline Drive Scenic Backway	COUT BAX-B, COUT BAX-C
241[1]	Dinosaur Diamond Scenic Byway in Canyon Pintado National Historic District (Colorado State Highway 139)	All COUT BAX
244	Garfield County Road 201 (south of Baxter Pass)	All COUT
260	Energy Loop Scenic Byway (Utah State Route 31)	COUT BAX-E
261	Fairview residential	COUT BAX-E
262	Mount Pleasant dispersed residences	COUT BAX-B, COUT BAX-C
265	Interstate 15 (Nephi)	All COUT BAX
279	Old Spanish National Historic Trail (near Thompson Springs, Utah)	All COUT BAX
282	I-70 Thompson Welcome Center (Dinosaur Diamond Scenic Byway)	All COUT BAX
284	Energy Loop Scenic Byway (Utah State Route 264)	COUT BAX-E
305	Wedge Overlook Scenic Backway	COUT BAX-B, COUT BAX-C
306	Upper Colorado River Scenic Byway	All COUT BAX
309[1]	Bear Creek Campground	COUT BAX-B, COUT BAX-C
310	Crook’s Brand Rock Art Site	All COUT BAX
319	Green River	All COUT BAX
320	Junction of Road to Buckhorn Wash	COUT BAX-B, COUT BAX-C
322	U.S. Highway 6 Rest Area (Dinosaur Diamond Scenic Byway)	COUT BAX-E
323[1]	Old Railroad Grade (adjacent to Mexican Mountain WSA)	COUT BAX-B
324	Dinosaur Diamond Scenic Byway (U.S. Highway 6 north of Woodside)	COUT BAX-E

NOTES:
[1] Cumulative effects simulation not prepared since the TransWest Express Transmission Project would not be visible in the extent of the direct effects simulation
Cumulative simulations are located in Appendix M.

Key Observation Point Number 32 – Cedar Mountain Overlook (San Rafael Swell) (simulation)

Superior views from the Cedar Mountain Overlook toward the San Rafael Swell have been modified minimally by development except for an existing transmission line, which has similar design characteristics as the Project; but due to its scale and material (wood) does not dominate these views. Through the introduction of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project, views would begin to be dominated by transmission line structures as well as the geometric features produced by the construction of access roads and vegetation clearing adjacent to the transmission structures as shown in the cumulative effects simulation. Since the view from this overlook focuses on the distant San Rafael Swell landscapes, Alternative COUT BAX-B would have a lower additive effect on these views since it would be located farther from the area of focused views. To minimize cumulative effects resulting from both of these transmission projects, potential mitigation would be to colocate with the existing transmission line to the extent practicable. In addition, there is a potential future wind farm located northeast of this viewpoint that would dominate views adjacent to this overlook and on views as recreationists walk back to their car or recreate at the adjacent picnic sites.

Key Observation Point Number 41 – Dinosaur Diamond Scenic Byway (U.S. Highway 6)

Long-duration views along this scenic byway have been influenced by existing modifications including a transmission line and railroad line; but due to the relative scale of these features, they do not dominate views from the scenic byway. Through the development of the Project (Alternatives COUT BAX-C and COUT BAX-E) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, motorists traveling along this scenic backway would experience a tunnel-effect since these two proposed projects are located on opposite sides of the road. Since the direct effects simulation does not include the area west of the road, where the TransWest Express Transmission Project is located, this cumulative effect was not simulated. To minimize the expansion of the area viewed as a utility corridor, and as modified, mitigation would include colocation of the two transmission projects on the east of the existing transmission line to the extent practicable and share construction access if feasible. By placing these two transmission projects closer to the Book Cliffs landscape, the complex backdropping condition, based on strong topographical features, can be used to reduce the visual dominance of these projects.

Key Observation Point Number 152 – Interstate 70 Harley Dome Rest Area (Dinosaur Diamond Scenic Byway) (simulation)

Views from this rest area have few visible modifications to the northwest, toward the Project, but it is important to note, I-70 and the rest area's parking lot are located to the south of this viewpoint. The introduction of the Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project, both located more than 1 mile away, would begin to dominate views from this rest area and overlook as shown in the cumulative effects simulation. Due to intermittent topographic screening and backdropping by the distant Tavaputs Plateau landscape (including the Book Cliffs), the two proposed transmission line projects would not dominate these views.

Key Observation Point Number 193 – Interstate 70 Crescent Junction Rest Stop (Dinosaur Diamond Scenic Byway) (simulation)

Existing development has modified views from the Crescent Junction Rest Stop including I-70 as well as through the potential introduction of additional industrial structures, which would be expanded through further development of adjacent oil and gas lease areas. The Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project would further industrialize this area through the construction of a series of transmission line structures that would begin to dominate views from this overlook as shown in the cumulative effects simulation. In particular, the TransWest Express Transmission Project, which is located approximately 0.5 mile away, would further modify the landscapes adjacent to this viewpoint whereas the Project would be located approximately 1 mile away. To reduce the cumulative effect introduced by both of these projects, potential mitigation would be to colocate closer to the Book Cliffs to use the complex backdropping afforded by that landscape to the extent practicable.

Key Observation Point Number 195 – Indian Creek Campground (simulation)

Views from this campground are enclosed with the adjacent existing transmission line being mostly screened by vegetation, which produces a nearly intact appearing landscape character. If existing BLM Price Field Office oil and gas leases were to be developed, views may become more influenced by development if wells were located on ridges or other high points in view of the campground. Transmission structures associated with the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project would be visible over the trees, which screen views of the existing transmission line, due to the proximity of these projects to the campground and the height of the proposed structures as shown in the cumulative effects simulation. To reduce cumulative effects on these views, potential mitigation would be to colocate the two transmission projects as close to the existing transmission line as practicable.

Key Observation Point Number 217 – Skyline Drive Scenic Backway (simulation)

From this viewpoint along the Skyline Drive Scenic Backway, views are modified minimally by existing development compared to the area approximately 0.75 mile south of this location where an existing transmission line crosses the scenic road. Due to topographic screening, the existing transmission line has a localized effect on the scenic drive; and based on the relative scale and construction materials (wood), the existing transmission line does not dominate these views. Similar to the description for Indian Creek Campground, the BLM Richfield Field Office has oil and gas leases in the area and, if developed, would introduce additional structures inconsistent with the existing landscape character. Through the addition of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, the area north of the existing transmission line would become dominated by transmission lines, including their associated construction access roads and right-of-way vegetation clearing. By expanding the area influenced by these utility projects, views may become industrialized along this portion of the Skyline Drive Scenic Backway. To reduce the cumulative effect on these views, the two transmission projects could be colocated with the existing transmission line in Dry Pole Fork Canyon to limit the visibility of transmission lines projects from this scenic road.

Key Observation Point Number 241 – Dinosaur Diamond Scenic Byway in Canyon Pintado National Historic District (CO SH 139)

Views along this portion of the Dinosaur Diamond Scenic Byway generally are intact with few visible cultural modifications as the existing transmission line is screened by the adjacent ridge landscapes. The introduction of the Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project would dominate views from this location due to their proximity and visibility, in particular the Project would be skylined on the ridge east of the scenic road as shown in the cumulative effects simulation. To reduce cumulative effects on the scenic road, as well as views from the Canyon Pintado National Historic District, potential mitigation would include colocation of the two transmission projects adjacent to the existing transmission line where existing topographic screening can be used to the extent practicable as currently designed into the updated alignment for the TransWest Express Transmission Project.

Key Observation Point Number 244 – Garfield County Road 201 (south of Baxter Pass) (simulation)

Views along Garfield County Road 201, which provides access to the Demaree and Oil Spring WSAs, have been modified by the presence of existing pipelines that have produced areas of geometric right-of-way vegetation clearing adjacent to the road. Through the addition of the Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project, views from this road would become dominated by the presence of industrial utility development, including the introduction of transmission structures, additional right-of-way vegetation clearing, and construction access roads as shown in the cumulative effects simulation. Due to the separation between the Project and the TransWest Express Transmission Project in the narrow West Salt Creek Canyon, one project would likely need to be located on top of the steep canyon walls instead of being located on the flat canyon floor. The presence of skylined structures across the top of the canyon would further dominate views and to reduce cumulative effects on these views, potential mitigation would include colocation of the two transmission projects along the canyon floor to the extent practicable.

Key Observation Point Number 260 – Energy Loop Scenic Byway (Utah State Road 31) (simulation)

Motorists driving the Utah State Route 31 portion of the Energy Loop Scenic Byway would view areas along Cottonwood Creek that have been influenced minimally by development. Through the addition of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, views would begin to become dominated by transmission line facilities including transmission line structures, associated access roads, and right-of-way vegetation clearing as shown in the cumulative effects simulation. Since the TransWest Express Transmission Project parallels the scenic byway for approximately 2.5 miles, whereas the Project crosses the road and is located approximately 0.5 mile away from the road where views toward the Project would be partially screened, potential mitigation would include colocation of the two projects north of the scenic byway to reduce the cumulative effect on these views.

Key Observation Point Number 261 – Fairview Residential (simulation)

Views from residences in the community of Fairview have been modified where existing development is located between the viewer and the Wasatch Plateau (as shown in the visual simulation). Other than the existing development in and around Fairview, the character of the Wasatch Plateau, as viewed from Fairview, has been modified minimally by development. Through the introduction of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, views from Fairview would be influenced by the associated transmission line structures, right-of-way vegetation clearing, and access roads as shown in the cumulative effects simulation. Due to the distance between the viewpoint and these projects, approximately 2 miles, these two projects would not dominate views from Fairview.

Key Observation Point Number 262 – Mount Pleasant Dispersed Residences (simulation)

The area of dispersed residences east of Mount Pleasant have views, which have been modified by the existing transmission line that traverses the Wasatch Plateau through the presence of transmission lines structures and right-of-way vegetation clearing. Due to the relative scale and construction materials (wood) of the existing transmission line, it does not dominate views from these residences. Through the introduction of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project into this area, which have design characteristics in common with the existing transmission line, views would become dominated by three transmission lines that would locate many residences between each subsequent transmission line as shown in the cumulative effects simulation. In other words, residences would have views of transmission lines looking both to the northeast and southwest, creating a type of tunnel-effect. As such, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line to the extent practicable to reduce cumulative effects on views from these residences.

Key Observation Point Number 265 – Interstate 15 (Nephi) (simulation)

Motorists driving I-15 near Nephi have views that have been modified by existing development including several transmission lines, development in and around Nephi, and the interstate highway itself. These existing modifications begin to dominate views, especially north of Nephi, producing a landscape character viewed as industrial in nature. Through the introduction of the Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project, which have similar design characteristics compared to the existing transmission lines, views from I-15 north of Nephi would be dominated by transmission lines including several skylined transmission structures that further dominate views due to their visibility on ridges as shown in the cumulative effects simulation. To minimize cumulative effects on these views, the two proposed transmission projects could be colocated with the existing transmission lines and use topographic screening opportunities to the extent practicable.

Key Observation Point Number 279 – Old Spanish National Historic Trail (near Thompson Springs, Utah) (simulation)

Views from the Old Spanish NHT have been modified by the railroad line to the north and I-70 to the south. These modifications do not dominate views but have diminished the integrity of this area, which may be further modified as a result of development of areas leased for oil and gas production. With the addition of the Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project, these views would be modified further and dominated by transportation and utility infrastructure including the presence of tall transmission line structures as shown in the cumulative effects simulation. Views to the north, toward the Book Cliffs, offer a complex backdropping element, which reduces dominance of lattice transmission structures as they begin to blend visually with this landscape. To reduce cumulative effects further, the two transmission projects should be colocated north of the railroad line to the extent practicable to minimize the extent of the area viewed as a utility corridor along this nationally significant viewing location.

Key Observation Point Number 282 – Interstate 70 Thompson Welcome Center (Dinosaur Diamond Scenic Byway) (simulation)

Similar to the description for the adjacent KOP No. 279, views from the Thompson Welcome Center have been modified by the existing railroad line and interstate. Views from this location toward the north are partially screened by topography, which would reduce the dominance of future development including the Project and the TransWest Express Transmission Project as shown in the cumulative effects simulation. Therefore, views north toward the Book Cliffs would begin to be dominated by development but would not be completely dominated.

Key Observation Point Number 284 – Energy Loop Scenic Byway (Utah State Route 264) (simulation)

Motorists driving the Utah State Route 264 portion of the Energy Loop Scenic Byway have views minimally modified by development except for the cluster of summer homes located to the south. Through the introduction of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, views along this portion of the Energy Loop Scenic Byway would begin to become dominated by transmission line structures and potentially through associated right-of-way vegetation clearing as shown in the cumulative effects simulation. To minimize the cumulative effect on these views of two geometric-cleared rights-of-way, potential mitigation would include colocation of the two transmission projects east of the aspen groves, visible in the simulation, to the extent practicable. It is important to note that a future reservoir is planned to be located in this area, the Narrows Reservoir, which would require the scenic byway to be relocated to the north. The future reservoir itself may increase landscape variety and be seen as a positive cumulative effect; but based on the final alignment for the highway, this realignment may cause additional cumulative effects on views from the scenic byway as a result of longer duration views of the previously mentioned transmission line projects, including the Project.

Key Observation Point Number 305 – Wedge Overlook Scenic Backway (simulation)

Views from this portion of the scenic backway have been minimally modified by development including an existing transmission line located approximately 2.5 miles away, which due to its scale and construction materials (wood), does not dominate these views. Future development in this area is limited mostly to the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project. Since these two transmission projects are planned to be located more than 2 miles from this viewpoint, the presence of these three transmission lines would begin to dominate views; but due to the backdropping afforded by Cedar Mountain, the structures would not completely dominate these views as shown in the cumulative effects simulation. To reduce cumulative effects on views from this scenic backway, potential mitigation would include colocation of the two proposed transmission lines as close to the existing transmission line as practicable.

Key Observation Point Number 306 – Upper Colorado River Scenic Byway (simulation)

Motorists driving this portion of the Upper Colorado River Scenic Byway would have views modified by existing development including an adjacent communication facility, I-70, and a railroad line located approximately 0.5 mile away. If oil and gas wells are placed on active Utah SITLA-administered oil and gas leases adjacent to the scenic road, this area would be further influenced by infrastructure development. With the addition of the Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project, views from this portion of the scenic byway would become dominated by development, in particular the introduction of several transmission line structures approximately 0.5 mile away as shown in the cumulative effects simulation. To minimize cumulative effects on these views, the two transmission projects could be colocated farther to the north where the complex backdropping afforded by the distant Book Cliffs could be used to reduce dominance of the proposed transmission lines structures.

Key Observation Point Number 309 – Bear Creek Campground

Views from this campground have been modified by several transmission lines, the Huntington Power Plant, and existing and leased oil and gas development. It is important to note that due to the enclosed views from in the southern portion of the campground, where the simulation was developed, these existing modifications are not visible whereas views at the entrance of the campground are dominated by these existing features. The TransWest Express Project would be located adjacent to the existing transmission lines and would be mostly screened from this KOP location. Through the introduction of the Project (Alternatives COUT BAX-B and COUT BAX-C), views would be affected minimally where the existing industrial modifications are visible but where enclosed views in the campground would only view the project in steep terrain approximately 2 miles away, these views would be influenced by energy-related development. In particular, repeating transmission lines structures, right-of-way vegetation clearing, and construction access roads would be visible near the ridgeline.

Key Observation Point Number 310 – Crook’s Brand Rock Art Site (simulation)

Views from this rock art site, including the associated recreation area, have been influenced by adjacent oil and gas development that may be enlarged through continued expansion of oil and gas wells onto existing lease areas. These existing features do not dominate views from this location and typically are screened by adjacent vegetation except from elevated viewpoints. With the addition of the Project (all COUT BAX alternative routes) approximately 0.5 mile away and the TransWest Express Transmission Project approximately 1 mile away, these two transmission lines would begin to dominate views from this site through the addition of tall transmission line structures that would rise above the pinyon-juniper vegetation present in this area as shown in the cumulative effects simulation. To minimize cumulative effects on views from this rock art site, the two projects should be colocated farther from this site, to the extent practicable, which would reduce the visual dominance of these projects using additional screening and backdropping opportunities.

Key Observation Point Number 319 – Green River (simulation)

Recreationists along this portion of the Green River have views influenced by an existing transmission line, which due to its relative scale and construction materials (wood), does not dominate views. Adjacent areas leased for oil and gas development would further influence views along the Green River but would likely be screened from view in this area. With the addition of the Project (all COUT BAX alternative routes) and the TransWest Express Transmission Project, views would begin to be dominated by transmission line structures. In particular, structures may be skylined on high points, which would further dominate views from the Green River as shown in the cumulative effects simulation. To reduce the cumulative effect on these views, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line in an area where the number of skylined structures would be minimized to the extent practicable.

Key Observation Point Number 320 – Junction of Road to Buckhorn Wash (simulation)

Similar to the description for the adjacent KOP No. 305, this viewpoint has views influenced by an existing transmission line; except due to the proximity to the existing transmission line, approximately 1 mile away, views are more dominated by the repeating pattern of transmission lines structures than from KOP No. 305. The backdropping afforded by Cedar Mountain would reduce the dominance of these proposed projects as the lattice structures would begin to blend with the complex forms found on the southern edge of Cedar Mountain as shown in the cumulative-effects simulation. To minimize cumulative effects on views in this area, through the addition of the Project (Alternatives COUT BAX-B and COUT BAX-C) and the TransWest Express Transmission Project, the three transmission lines should be colocated to the extent practicable, which would reduce the visual dominance of these transmission line structures.

Key Observation Point Number 322 – U.S. Highway 6 Rest Area (Dinosaur Diamond Scenic Byway) (simulation)

Views from this rest area have been modified by its associated facilities, U.S. Highway 6, and an existing transmission line located approximately 1 mile away. From this location, these features do not dominate views; but through potential development of areas leased for oil and gas wells, existing development would have a more dominant effect on views. Through the introduction of the Project (Alternative COUT BAX-E) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, views would be further modified and would begin to be dominated by infrastructure development as shown in the cumulative effects simulation. Due to the location of both of these transmission projects, located farther from the viewer than the existing transmission line as well as opportunities for backdropping the structures, these two projects would not extensively expand the area viewed from this rest area as influenced by development. In addition, views from the rest area are screened intermittently toward the area potentially traversed by these two transmission lines projects that further reduces their anticipated level of dominance.

Key Observation Point Number 323 – Old Railroad Grade (adjacent to Mexican Mountain Wilderness Study Area)

Views from Cottonwood Wash Road, which parallels the Old Railroad Grade, have been modified by an existing transmission line. Due to the scale of the existing transmission line and construction materials (wood), views would begin to become dominated by this feature but would not completely dominate views. Construction of wells, and associated facilities, on lands leased for oil and gas development would be mostly screened by topography from this viewpoint. Due to adjacent topographic screening, views of the future power generation facility at the Woodside site would be screened from view and the only visible modification would be the associated plume during particular weather conditions. The addition of the Project (Alternative COUT BAX-B) would introduce additional transmission lines structures, which have similar design characteristics and when seen in context with the existing transmission line, would dominate views in this area as shown in the cumulative effects simulation. In particular, the transmission line structures running parallel with the road producing long-duration views looking down the corridor. Please note the TransWest Express Transmission Project does not have a colocated route in this area.

Key Observation Point Number 324 – Dinosaur Diamond Scenic Byway (U.S. Highway 6 north of Woodside) (simulation)

Motorists driving this portion of U.S. Highway 6, part of the Dinosaur Diamond Scenic Byway, would have long duration views of an existing transmission line and railroad line; but due to the relative scale of these features, they do not dominate views from the scenic byway. Areas leased for oil and gas wells, if developed, would further influence views from the scenic byway. The future power generation facility at the Woodside site would dominate views along this portion of the scenic byway through the introduction of a large-scale industrial facility directly adjacent to the scenic byway. The Project (Alternative COUT BAX-E) and the proposed TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would increase the level of dominance produced by energy-related development adjacent to the Dinosaur Diamond Scenic Byway as shown in the cumulative effects simulation. To minimize cumulative effects in this area, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line, instead of having one project located on each side of the highway as currently designed. To further reduce cumulative effects, the two projects should cross the highway adjacent to the proposed Woodside site so the scenic byway crossing would occur in this area of more intense potential industrial development instead of being in an area with less influence from industrial facilities.

4.3.18.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Scenery

Table 4-133 lists the cumulative effects for the COUT alternative routes.

TABLE 4-133
SCENERY CUMULATIVE EFFECTS SUMMARY FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE

Alternative Route	Total Available Resource	No Action Alternative		Incremental Project Development	Estimated Cumulative Development	Remaining Available Resource[1]	Percent of Scenery Units not Influenced by Development
		Past and Present Development	Reasonably Foreseeable Future Actions				
COUT-A	3,301,500	2,686,000	64,700	2,200	2,752,900	548,600	17
COUT-B	3,908,600	3,126,500	177,900	1,000	3,305,400	603,300	15
COUT-C (Agency and Applicant Preferred Alternative)	3,943,700	2,903,100	173,000	1,200	3,077,300	866,400	22
COUT-H	4,352,300	3,306,300	182,100	900	3,489,300	863,000	20
COUT-I	4,363,200	3,291,200	201,500	10,600	3,503,300	859,800	20

NOTES:
[1] Area of scenery units not influenced by development
Acreages are approximate and have been rounded to the nearest 100 acres; therefore, the columns may not total.

Issue Areas

Scenery issues, as described in the direct Project effects discussion in Chapter 3, include the following landscapes (SQRUs):

- Argyle Canyon
- Bad Land Cliffs
- Green River
- Strawberry River
- Tavaputs Plateau
- Wasatch Plateau Alpine
- Wasatch Plateau
- Wasatch Plateau Parks

In addition, through the analysis of cumulative effects on scenery, Book Cliffs Bench, Emma Park/Kyune, and Windy Ridge were identified as SQRUs where the Project's influence includes many areas not influenced by past, present, or other future actions.

Effects

Due to the presence of existing development and proposed future development, including but not limited to the TransWest Express Transmission Project, there are locations where entire scenery units would be influenced by past and present actions and RFFAs. As analyzed these landscapes (SQRUs) include Beaver Ridge, Flattop Butte, Fruitland, Pariette Bench, Red Wash/Kennedy Wash/Devil's Playground, Southern Bridgeland, Strawberry River, Walker Plateau West, and Wrinkles Road. These landscapes have been modified by existing areas leased for oil and gas development and existing transmission lines and pipelines.

The COUT alternative routes are similar in regard to overall cumulative effects except for Alternative COUT-I. As described previously, due to the colocation on most alternative routes of the Project and the TransWest Express Transmission Project, most areas would already have been influenced by the TransWest Express Transmission Project, and the addition of the Project would only intensify the cumulative effect on scenery. Since there is not an adjacent TransWest Express Transmission Project alternative route descending the Book Cliffs into Castle Valley, east of Wellington, Utah, the Project would extend the areas influenced by development through the construction and operation of the Project.

Argyle Canyon and Bad Land Cliffs

As delineated by the BLM Vernal and Price Field Offices, the Argyle Canyon and Jack Canyon WSA SQRUs contain Argyle Canyon and the Bad Land Cliffs, as well as a portion of Nine Mile Canyon east of Argyle Canyon and the area between Reservation Ridge and Emma Park. This landscape unit contains limited existing development except for a pipeline crossing the southeast corner of the landscape, a transmission line bisecting the landscape, and dispersed summer cabins. In addition, oil and gas leases are located on state-administered lands in this scenery unit that if developed, would modify the landscape character through the introduction of additional structures and associated access roads. Due to several alternative routes for both the Project (Alternatives COUT-B, COUT-C, COUT-H, and COUT-I) and the TransWest Express Transmission Project, a major portion of this landscape unit may become visually modified. By colocating the Project and TransWest Express with existing modifications along either Alternative COUT-B, COUT-C, COUT-H, or COUT-I, cumulative effects on this scenery unit would be minimized by limiting the expansion of areas influenced by development.

Book Cliffs Bench

This SQRU, as digitized by the BLM Price Field Office, would only be crossed by Alternative COUT-I and would be influenced by Alternative COUT-H. Existing development, including oil and gas (existing and leased areas) as well as a transmission line and pipeline, have visually influenced approximately 80 percent of this landscape. As stated earlier, since the TransWest Express Transmission Project does not have an alternative route adjacent to Alternative COUT-I, the Project would extend the influence of development in this landscape by approximately 7 percent through the introduction of transmission line structures, access roads, and right-of-way vegetation clearing. Due to the colocation of the Project on Alternative COUT-H with the TransWest Express Transmission Project, no additional areas would be influenced by the Project but instead, a more intense cumulative effect on scenery is anticipated due to the presence of two additional transmission lines in the Book Cliffs Bench SQRU.

Emma Park/Kyune

This landscape represents the area known as Emma Park located between the Book Cliffs and Reservation Ridge and includes SQRUs delineated by the BLM Price, Vernal, and Salt Lake Field Offices. Similar to the description of existing and future development for the Book Cliffs Bench, existing and leased areas for oil and gas development, an existing pipeline, two existing transmission lines, and other industrial facilities have influenced the majority of this landscape. Due to the colocation of the Project with the TransWest Express Transmission Project in this area along Alternatives COUT-B, COUT-C, and COUT-H, there are no additional areas that would be influenced by the Project, which would not be influenced by past, present, or future actions. Similar to the Book Cliffs Bench SQRU, Alternative COUT-I would influence an additional 3 percent of this landscape due to there not being an adjacent TransWest Express Transmission Project alternative route.

Green River

The BLM Vernal Field Office delineated two different SQRUs to represent the Green River—Horseshoe Bend and South Green River. Alternatives COUT-A and COUT-B cross the Horseshoe Bend unit and Alternatives COUT-C, COUT-H, and COUT-I cross the South Green River unit. Both of these landscapes have been influenced visually by existing areas leased for oil and gas development, as well as existing major linear utilities (transmission line across the Horseshoe Bend landscape and multiple pipelines crossing the South Green River). In addition, the TransWest Express Transmission Project shares similar alternative routes with the Project; and to minimize cumulative effects on the Green River, the two transmission projects should be colocated to the extent practicable.

Strawberry River

The scenery adjacent to the Strawberry River from Solider Creek Dam to Starvation Reservoir was delineated as one scenery unit with landscape character modifications primarily located along the western portion of the landscape. These existing modifications include a transmission line and the Solider Creek Dam. It is important to note that the Bill Barrett Lake Canyon EDA, an area leased for oil and gas development, completely overlaps the Strawberry River scenery unit. As such, this landscape may become modified along its entire length through the introduction of oil- and gas-related facilities. In addition to the existing transmission line along the west side of this landscape, the Project (Alternative COUT-A) as well the TransWest Express Transmission Project would further industrialize the area adjacent to the Solider Creek Dam and modify the existing landscape character through the presence of several transmission line structures, access roads, and right-of-way vegetation clearing.

Tavaputs Plateau

The Tavaputs Plateau scenery unit contains a major portion of the Duchesne Ranger District on the Ashley National Forest as well as the lands north toward U.S. Highway 40 including the area north of Reservation Ridge. Existing development is primarily located along the northern portion of Sowers Canyon, including oil and gas wells and a transmission line that have locally modified the landscape character. In addition, several oil and gas permitted areas overlap this landscape and if fully developed, would begin to produce an industrialized landscape character. This industrial character would be expanded through the introduction of the TransWest Express Transmission Project and the Project, especially along Alternative COUT-B, which bisects the scenery unit.

Wasatch Plateau Alpine

This scenery unit was digitized to represent the western ridgeline of the Wasatch Plateau above the community of Mount Pleasant. Other than an existing transmission line, which crosses the ridge, there are few existing landscape character modifications. The majority of this area has been leased by the BLM Richfield Field Office for oil and gas development, which would further modify the landscape character. The addition of the Project (Alternative COUT-I) and the TransWest Express Transmission Project would begin to industrialize the area above Potters Pond through the presence of transmission line structures, access roads, and geometric right-of-way vegetation clearing. To reduce cumulative effects on this narrow scenery unit, the two proposed transmission lines should be located as close as practicable to the existing transmission line.

Wasatch Plateau

The scenery unit that comprises the northern portion of the Wasatch Plateau covers a large portion of the Manti-La Sal National Forest from U.S. Highway 6 to Joes Valley Reservoir. As such, there are areas of more intense existing development and areas with limited landscape character modifications. Existing modifications include surface facilities associated with underground coal mining, existing transmission lines and pipelines, and areas leased for oil and gas development. With the addition of the TransWest Express Transmission Project into this scenery unit, the Project along Alternatives COUT-H and COUT-I would visually influence a small area that has not already been influenced by past or present actions; whereas the other COUT alternative routes would visually influence approximately 400 additional acres. The presence of the Project, including the transmission line structures, access roads, and right-of-way vegetation clearing, would produce a more intense localized cumulative effect on scenery if the Project were colocated with TransWest Express and the existing transmission line along Alternatives COUT-A, COUT-B, COUT-C, or COUT-I. Whereas if the Project and the TransWest Express Transmission Project were not colocated, there would be a more diffuse but widespread cumulative effect on the Wasatch Plateau landscape in context with other past, present, and future actions.

Wasatch Plateau Parks Landscape

There are two park landscapes located on the Wasatch Plateau with the area known as Scad Valley, which would be crossed by Alternative COUT-I, and the park adjacent to Gooseberry Creek (Gooseberry Creek Valley), which would be crossed by Alternative COUT-H. Scad Valley has few existing cultural modifications except for the presence of an existing transmission line; but through development of oil and gas lease areas as well as coal lease areas, this landscape has the potential to become industrialized. In addition to the past and present development in Scad Valley, the introduction of the Project and the TransWest Express Transmission Project would further industrialize the southern portion of this landscape unit through the presence of transmission line structures, access roads, and right-of-way vegetation clearing. The other park landscape, Gooseberry Creek Valley, has fewer existing landscape character deviations than Scad Valley, except for oil and gas lease areas along the eastern edge of this scenery unit. An existing pipeline is located along the northern edge of the landscape, which has modified the local character through geometric right-of-way vegetation clearing. Future development, including industrial facilities associated with the Narrows Dam and Reservoir, TransWest Express Transmission Project, and the Project, would further modify the landscape character through the introduction of industrial structures, access roads, and vegetation clearing.

Windy Ridge

This landscape was delineated to represent a ridge between Roosevelt, Utah, and the Duchesne River. Adjacent oil and gas development has a limited visual influence on this landscape as there are no wells located on Windy Ridge. An existing transmission line has influenced approximately half of this scenery unit and with the addition of the Project (Alternatives COUT-A and COUT-B) as well as the TransWest Express Transmission Project; the influence of development would be extended farther into this landscape. Due to the separation between the Project and the TransWest Express Transmission Project, the Project would influence an additional 2 percent of this landscape as well as producing a more intense, industrialized landscape character along the northern portion of this landscape as a result of the presence of three transmission lines.

Viewing Locations

Views from identified viewing locations would have a range of cumulative effects resulting from the addition of the Project in context with past, present, and future actions and to focus on the key issues, this analysis will focus on the 21 simulation locations identified in Table 4-134 along the COUT alternative routes.

TABLE 4-134
CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Routes
87	Enron Recreation Area (on White River)	COUT-C, COUT-H, COUT-I
109[1]	Dispersed residences south of Roosevelt	COUT-A, COUT-B
195	Indian Creek Campground	COUT-I
200[1]	Argyle Canyon Road	COUT-C, COUT-H, COUT-I
203	Fourmile Bottom	COUT-C, COUT-H, COUT-I
208	West Helper residential	COUT-H
211	Dinosaur Visitor Center	All COUT
217[1]	Skyline Drive Scenic Backway	COUT-I
260	Energy Loop Scenic Byway (Utah State Route 31)	COUT-H
261	Fairview residential	COUT-H
262	Mount Pleasant dispersed residences	COUT-I
265	Interstate 15 (Nephi)	All COUT
266	U.S. Highway 6 (Spanish Fork Canyon)	COUT-A, COUT-B, COUT-C
269[1]	Fruitland residential	COUT-A
272	Sand Wash North Destination Route	COUT-C, COUT-H, COUT-I
274	Indian Canyon Scenic Byway (U.S. Highway 191)	COUT-H
284	Energy Loop Scenic Byway (Utah State Route 264)	COUT-H
285	Aspen Grove Campground	COUT-A

TABLE 4-134
CUMULATIVE EFFECTS SIMULATION LOCATIONS FOR THE COLORADO TO UTAH – U.S. HIGHWAY 40 TO CENTRAL UTAH TO CLOVER (COUT) ALTERNATIVE ROUTES

Simulation Location (Key Observation Point) Number	Simulation Location (Key Observation Point) Name	Alternative Routes
304	Sheep Creek Road (Forest Road 042)	COUT-A
309[1]	Bear Creek Campground	COUT-I
325[1]	Argyle Canyon residences	COUT-B

NOTES:
[1] Cumulative effects simulation not prepared since the TransWest Express Transmission Project would not be visible in the area of the direct effects simulation
Cumulative effects simulations are located in Appendix M.

Key Observation Point Number 87 – Enron Recreation Area (on White River) (simulation)

Recreationists at this campground and river put-in on the White River have views that have been minimally influenced by development due to the enclosed views in this area. Existing oil and gas development is located on the plateaus above the river but is screened from view at this recreation area. If wells, as part of permitted oil and gas leases, were to be developed adjacent to the river, views would become influenced by these wells including the introduction of industrial structures. Through the development of the Project (Alternatives COUT-C, COUT-H, and COUT-I) and the TransWest Express Transmission Project, views would become dominated by transmission lines including the presence of multiple skylined transmission structures on adjacent ridgelines as shown in the cumulative effects simulation. To reduce cumulative effects on views from this recreation area, potential mitigation would include colocation of the two projects and maximizing the distance between transmission structures at the river crossing, to the extent practicable, to minimize the number and visibility of proposed transmission line structures adjacent to the river.

Key Observation Point Number 109 – Dispersed Residences South of Roosevelt

Views from dispersed residences south of the community of Roosevelt have views modified by existing rural development including agricultural fields, dispersed residences, and associated utilities. Residences adjacent to the existing transmission line in this area have locally modified views that diminish based on distance from the existing transmission line as well as through topographic screening. In the location where the simulation was developed looking south, the existing transmission line is not visible and is located approximately 0.5 mile to the north. As such, views from this group of residences have been modified minimally by development. The introduction of the Project (Alternatives COUT-A and COUT-B) and the TransWest Express Transmission Project (located north of the viewpoint and also not shown in the simulation), which both have design characteristics in common with the existing transmission line, would further modify views from dispersed residences; and due to the separation between each subsequent transmission line, residences would be located in between transmission lines, producing a wide area viewed as a transmission line corridor. To reduce cumulative effects on these dispersed residences, colocation of the two proposed transmission lines with the existing transmission line would intensify cumulative effects for some residences, located adjacent to the existing transmission line, but would diminish the overall extent of the cumulative effects through the widening of this transmission line corridor.

Key Observation Point Number 195 – Indian Creek Campground (simulation)

Views from this campground are enclosed with the adjacent existing transmission line being mostly screened by vegetation, which produces a nearly intact appearing landscape character. If existing BLM Price Field Office oil and gas leases were to be developed, views may become more influenced by development if wells were located on ridges or other high points in view of the campground. Transmission structures associated with the Project (Alternative COUT-I) and the TransWest Express Transmission Project would be visible over the trees, which screen views of the existing transmission line, due to the proximity of these projects to the campground and the height of the proposed structures as shown in the cumulative effects simulation. To reduce cumulative effects on these views, potential mitigation would be to colocate the two transmission projects as close to the existing transmission line as practicable. It is important to note that the alignment for the TransWest Express Transmission Project was modified to be located 1,500 feet south of the existing transmission line for the simulation due to multiple crossings of the Project alignment. As such, the simulation illustrates that the TransWest Express Transmission Project would be mostly screened from view.

Key Observation Point Number 200 – Argyle Canyon Road (simulation)

Views along this portion of the Argyle Canyon Road have been modified minimally by development except for a few dispersed residences and associated agricultural fields which produce a rural character in this area. The introduction of the Project (Alternatives COUT-H and COUT-I) and the TransWest Express Transmission Project would produce highly modified views along this portion of Argyle Canyon Road. These modifications are a result of several skylined transmission structures, right-of-way vegetation clearing, and a complex network of roads to access the structure pads on very steep terrain. Alternative COUT-C, and adjacent the TransWest Express Project route, would produce less modified views since the projects would be colocated and perpendicularly cross Argyle Canyon instead of paralleling the road for approximately 2 miles.

Key Observation Point Number 203 – Fourmile Bottom (simulation)

Recreationists at the Fourmile Bottom put-in, as well as floating on this portion of the Green River, have views intermittently influenced by development. These include views of an existing pipeline corridor and potential views of existing and/or areas leased for oil and gas development where the adjacent canyon walls are shorter and do not screen views from the river. Through the introduction of the Project (Alternatives COUT-C, COUT-H, and COUT-I) and the TransWest Express Transmission Project, views at and adjacent to the Fourmile Bottom put-in would be modified by skylined transmission structures and access road construction in steep terrain as shown in the cumulative effects simulation. To reduce cumulative effects on these views, potential mitigation would include colocation of the two transmission projects and maximizing the distance between structures at the river crossing to the extent practicable. By placing the structures at the edge of the canyon walls, no structures would be placed adjacent to the river, which would decrease the cumulative effect on these views.

Key Observation Point Number 208 – West Helper Residential (simulation)

Views from residences in Spring Canyon, west of Helper, have been modified by existing utilities and an elevated railroad line located west of this group of residences. These modifications influence but do not dominate the views from this location. The addition of the Project (Alternative COUT-H) and the TransWest Express Transmission Project would produce views that would begin to be dominated by transmission lines, including a skylined transmission structure located on the ridge adjacent to these residences as well as through the construction of access roads and right-of-way vegetation clearing as shown in the cumulative effects simulation. To minimize cumulative effects on these views, the two transmission line projects could be colocated adjacent to the existing railroad line, which would offer partial screening opportunities and, therefore, reduce effects on views from these residences.

Key Observation Point Number 211 – Dinosaur Visitor Center (simulation)

Views from the Dinosaur National Monument Visitor Center in Colorado have been influenced by an existing transmission line and U.S. Highway 40, but these features do not dominate views from the visitor center. There is another larger transmission line, which is mostly screened by the ridge, visible in the simulation but is seen in a skylined condition approximately 6 miles away. Through the addition of the Project (all COUT alternative routes) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, views would begin to become dominated by transmission lines, in particular through the introduction of skylined transmission structures 1.25 mile away as shown in the cumulative effects simulation. Alternatives COUT-C, COUT-H, and COUT-I would have lower additive cumulative effects on views from the visitor center since the Project would be screened partially by the previously mentioned ridge. To reduce cumulative effects on views from the location, the two proposed transmission projects could be colocated south of the ridge to minimize their level of dominance on views from the Dinosaur National Monument.

Key Observation Point Number 217 – Skyline Drive Scenic Backway (simulation)

From this viewpoint along the Skyline Drive Scenic Backway, views are modified minimally by existing development compared to the area approximately 0.75 mile south of this location where an existing transmission line crosses the scenic road. Due to topographic screening, the existing transmission line has a localized effect on the scenic drive; and based on the relative scale and construction materials (wood), the existing transmission line does not dominate these views. Similar to the description for Indian Creek Campground, the BLM Richfield Field Office has oil and gas leases in the area and if developed, would introduce additional structures inconsistent with the existing landscape character. Through the addition of the Project (Alternative COUT-I) and the TransWest Express Transmission Project, the area north of the existing transmission line would become dominated by transmission lines including their associated construction access roads and right-of-way vegetation clearing. By expanding the area influenced by these utility projects, views may become industrialized along this portion of the Skyline Drive Scenic Backway. To reduce the cumulative effect on these views, the two transmission projects could be colocated with the existing transmission line in Dry Pole Fork Canyon to limit the visibility of transmission line projects from this scenic road.

Key Observation Point Number 260 – Energy Loop Scenic Byway (UT SR 31) (simulation)

Motorists driving the Utah State Route 31 portion of the Energy Loop Scenic Byway would view areas along Cottonwood Creek that have been influenced minimally by development. Through the addition of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, views would begin to become dominated by transmission line facilities including transmission line structures, associated access roads, and right-of-way vegetation clearing as shown in the cumulative effects simulation. Since the TransWest Express Transmission Project parallels the scenic byway for approximately 2.5 miles and whereas the Project crosses the road and is located approximately 0.5 mile away from the road where views toward the Project would be screened partially, potential mitigation would include colocation of the two projects north of the scenic byway to reduce the cumulative effect on these views.

Key Observation Point Number 261 – Fairview Residential (simulation)

Views from residences in the community of Fairview have been modified where existing development is located between the viewer and the Wasatch Plateau (as shown in the visual simulation). Other than the existing development in and around Fairview, the character of the Wasatch Plateau, as viewed from Fairview, has been modified minimally by development. Through the introduction of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, views from Fairview would be influenced by the associated transmission line structures, right-of-way vegetation clearing, and access roads as shown in the cumulative effects simulation. Due to the distance between the viewpoint and these projects, approximately 2 miles, these two projects would not dominate views from Fairview.

Key Observation Point Number 262 – Mount Pleasant Dispersed Residences (simulation)

The area of dispersed residences east of Mount Pleasant have views, which have been modified by the existing transmission line that traverses the Wasatch Plateau through the presence of transmission lines structures and right-of-way vegetation clearing. Due to the relative scale and construction materials (wood) of the existing transmission line, it does not dominate views from these residences. Through the introduction of the Project (Alternative COUT-I) and the TransWest Express Transmission Project into this area, which have design characteristics in common with the existing transmission line, views would become dominated by three transmission lines that would locate many residences between each subsequent transmission line as shown in the cumulative effects simulation. In other words, residences would have views of transmission lines looking both to the northeast and southwest, creating a type of tunnel-effect. As such, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line to the extent practicable, reducing cumulative effects on views from these residences.

Key Observation Point Number 265 – Interstate 15 (Nephi) (simulation)

Motorists driving I-15 near Nephi have views that have been modified by existing development including several transmission lines, development in and around Nephi, and the interstate highway itself. These existing modifications begin to dominate views, especially north of Nephi, producing a landscape character viewed as industrial in nature. Through the introduction of the Project (all COUT alternative routes) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission lines, views from I-15 north of Nephi would be dominated by transmission lines, including several skylined transmission structures that further dominate views due to their visibility on ridges as shown in the cumulative effects simulation. To minimize cumulative effects on these views, the two proposed transmission projects could be colocated with the existing transmission lines and use topographic screening opportunities to the extent practicable.

Key Observation Point Number 266 – U.S. Highway 6 (Spanish Fork Canyon) (simulation)

Motorists on this portion of U.S. Highway 6 have views that are influenced, and in some locations dominated, by existing development including several transmission lines. The introduction of the Project (Alternatives COUT-A, COUT-B, and COUT-C) and the TransWest Express Transmission Project would, in addition to the existing transmission lines that have similar design characteristics as the Project, dominate views along this portion of U.S. Highway 6 as shown in the cumulative effects simulation. This level of dominance is a result of skylined transmission lines, right-of-way vegetation clearing in overstory vegetation, and the construction of access roads in steep terrain. To reduce cumulative effects on these views, potential mitigation would include colocation of the two proposed transmission projects with the existing transmission line and minimizing additional skylined transmission structures to the extent practicable.

Key Observation Point Number 269 – Fruitland Residential

Views from residences in Fruitland have been influenced, and locally dominated, by the existing transmission line. Residences located adjacent to the transmission line have views dominated by transmission structures; whereas, residences located farther away have less dominated views. These views have also been modified by U.S. Highway 40, as well as dispersed residences and associated agricultural lands, which create a rural character. Through development of areas leased for oil and gas wells, views also may become influenced by oil and gas development, including structures and associated access roads. The addition of the Project (Alternative COUT-A) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would further extend the area dominated by transmission lines. The Project is colocated with the existing transmission line which would not considerably extend the area viewed as a transmission line corridor. The TransWest Express Transmission Project alternative route (not visible in the simulation) is located more than 1 mile from the existing transmission line, which would extend the visual influence of transmission lines to larger number of residences in and around Fruitland. To minimize these cumulative effects, the two proposed transmission lines should be colocated with the existing transmission line to the extent practicable.

Key Observation Point Number 272 – Sand Wash North Destination Route (simulation)

Recreationists on this portion of Sand Wash Road, traveling to the Sand Wash put-in on the Green River, have views that have been minimally influenced by existing development when compared to the more extensive oil and gas dominated landscapes this road passes through to the north. Areas leased, but not yet developed, for oil and gas wells would introduce industrial facilities into a natural appearing landscape and would modify these views. Through the addition of the Project (Alternatives COUT-C, COUT-H, and COUT-I) and the TransWest Express Transmission Project, these views would become dominated by energy-related infrastructure, including a variety of different structures types and a network of access roads as shown in the cumulative effects simulation. To reduce cumulative effects on these views, potential mitigation would be to colocate the two proposed transmission lines to the extent practicable to minimize the additional effect of these projects, in context with expanding oil and gas fields, on views from this recreation destination route.

Key Observation Point Number 274 – Indian Canyon Scenic Byway (U.S. Highway 191) (simulation)

Motorists on this portion of the Indian Canyon Scenic Byway have views influenced by an existing transmission line; but due to the scale of the existing transmission line and construction materials (wood); this feature does not dominate views from the scenic road. Existing oil and gas wells are located on the flat plateau lands above the canyon and as such, are not visible in this portion of the scenic byway. The addition of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would produce views dominated by transmission lines, including a series of transmission structures paralleling the road, additional right-of-way vegetation clearing, and construction access roads as shown in the cumulative effects simulation. Due to the steep, forested slopes, the two proposed transmission projects should be colocated with the existing transmission line to the extent practicable to minimize cumulative effects through the expansion of the area viewed as a transmission line corridor.

Key Observation Point Number 284 – Energy Loop Scenic Byway (Utah State Route 264) (simulation)

Motorists driving the Utah State Route 264 portion of the Energy Loop Scenic Byway have views minimally modified by development except for the cluster of summer homes located to the south. Through the introduction of the Project (Alternative COUT-H) and the TransWest Express Transmission Project, views along this portion of the Energy Loop Scenic Byway would begin to become dominated by transmission line structures and potentially through right-of-way vegetation clearing as shown in the cumulative effects simulation. To minimize the cumulative effects on these views of a geometric-cleared right-of-way, potential mitigation would include colocation of the two transmission projects east of the aspen groves, visible in the simulation, to the extent practicable. It is important to note that a future reservoir is planned to be located in this area, the Narrows Reservoir, which would require the scenic byway to be relocated to the north. The future reservoir itself may increase landscape variety and be seen as a positive cumulative effect; but based on the final alignment for the highway, this realignment may cause additional cumulative effects on views from the scenic byway as a result of longer duration views of the previously mentioned transmission line projects, including the Project.

Key Observation Point Number 285 – Aspen Grove Campground (simulation)

Views from the Aspen Grove Campground have been minimally influenced by development except for recreation based development, including the adjacent marina, campground, and summer homes. The existing transmission line is screened from view in this area by topography and, as such, does not influence views from this campground. Due to constraints resulting from the location of the existing transmission line and separation between the Project (Alternative COUT-A) and the TransWest Express Transmission Project, these transmission lines would be visible from the campground and would modify the associated views through the introduction of skylined transmission structures, right-of-way vegetation clearing, and potentially the construction of access roads as shown in the cumulative effects simulation. To minimize these cumulative effects on views, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line to the extent practicable to reduce the visibility of these features. In addition, a proposed residential development is planned to be located on the ridge which may modify views from the campground if residences are skylined on the ridge.

Key Observation Point Number 304 – Sheep Creek Road (Forest Road 042) (simulation)

Motorists driving Forest Road 042 in the Uinta-Wasatch-Cache National Forest have views influenced but not dominated by existing development, including an existing transmission line which traverses the ridge and introduces a skylined transmission structure and geometric right-of-way vegetation clearing. The addition of the Project (Alternative COUT-A) and the TransWest Express Transmission Project, which have design characteristics in common with the existing transmission line, would further modify these views and dominate views from this overlook through a series of skylined structures on the ridge and cleared rights-of-way as shown in the cumulative effects simulation. This crossing may require taller structures and would benefit from micro-siting of structures to minimize cumulative effects on these views. To further reduce cumulative effects, the two transmission projects should be colocated with the existing transmission line to the extent practicable, which would decrease the area viewed as a transmission line corridor.

Key Observation Point Number 309 – Bear Creek Campground

Views from this campground have been modified by several transmission lines, the Huntington Power Plant, and existing and leased oil and gas development. It is important to note that due to the enclosed views from in the southern portion of the campground, where the simulation was developed, these existing modifications are not visible whereas views at the entrance of the campground are dominated by these existing features. The TransWest Express Project would be located adjacent to the existing transmission lines and would be mostly screened from this KOP location. Through the introduction of the Project (Alternative COUT-I), views would be affected minimally where the existing industrial modifications are visible but where enclosed views in the campground would only view the project in steep terrain approximately 2 miles away, these views would be influenced by energy-related development. In particular, repeating transmission lines structures, right-of-way vegetation clearing, and construction access roads would be visible near the ridgeline.

Key Observation Point Number 325 – Argyle Canyon Residences (simulation)

Views from residences and summer homes in this portion of Argyle Canyon have been influenced by an existing transmission line; but due to its scale and materials (wood), as well as through vegetation screening, it does not dominate these views. The addition of the Project (Alternative COUT-B) and the

TransWest Express Transmission Project would produce views beginning to be dominated by transmission lines including taller steel structures, which may rise above the trees screening the existing transmission line and introduce additional areas of vegetation clearing into these views. To minimize cumulative effects on views from these residences, potential mitigation would be to colocate the two proposed transmission lines with the existing transmission line where existing topography and vegetation can be used to partially, or if possible, completely screen views of these projects.

Key Observation Point Number 328 – Indian Canyon Scenic Byway

Motorists on this portion of the Indian Canyon Scenic Byway have views influenced by scattered recreation cabins and to the northeast of this viewpoint an existing communication facility on Argyle Ridge, which does not dominate views along the scenic byway. Through the addition of the Project and the TransWest Express Transmission Project, these views would begin to become dominated by utility development along this portion of the scenic road. These projects would include the introduction of skylined transmission structures, right-of-way vegetation clearing, and associated access roads, which are inconsistent with the existing landscape character viewed from this location. To reduce the cumulative effect on these views, the two transmission projects could be colocated to the extent practicable in addition to limiting vegetation clearing in the projects' rights-of-way and using existing screening opportunities through tower micro-siting.

4.3.19 National Trails System

The approach for analyzing cumulative effects on national scenic and historic trails (including trails undergoing feasibility study) was based on direction provided in BLM Manual 6280 and through coordination with the BLM National Trails' staff. Cumulative effects on National Trails would result from the incremental effects on trail-associated resources as well as future management of the trail through development of past and present actions and RFFAs.

The geographic scope for analyzing cumulative effects on NSTs was identified as the extent of the trail alignment located in the BLM Field Offices traversed by the Project. For NHTs, the geographic scope was defined by the high potential route segments and high potential historic sites, or feasibility study alignments for trails under study, identified in the areas located adjacent to the Project. The temporal scope for analysis of cumulative effects on both NSTs and NHTs (including trails under feasibility study) was defined by the duration of the agency right-of-way grant for the Project (50 years), but it is important to note that potential future right-of-way grant extensions may extend the life of the Project beyond 50 years. The cumulative effect analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.19) and considers them in context with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.19.1 Issues Identified for Analysis

4.3.19.1.1 Effects on Trail's Resources, Qualities, Values, Associated Settings, or Primary Use(s)

Cumulative effects on a NST or NHT (including trails under feasibility study) may result from the development of past and present actions and RFFAs through the modification of the trail's resources, qualities, values, associated settings, or primary use(s). This analysis was completed in a manner consistent with the direct and indirect impact methodology described in Chapter 3 of this document. In general, those areas where transmission line projects would be colocated such that they are consolidated physically, as well as visually, effects would be reduced. Matching spans to the extent practicable and sharing construction and maintenance access roads would further reduce cumulative effects of such projects. In locations where projects would deviate from using the same corridor, cumulative effects generally increase as the trail's resource and settings become more fragmented; and in regard to scenic resources specifically, the industrial nature of transmission line projects would have a stronger effect on the trail setting. In addition, if the past, present, and future projects are visually similar (i.e., transmission lines seen in context with other transmission lines); the dominance of the aggregate of projects is reduced. Inversely, if the aggregate of the projects are incongruent (i.e., a mixture of natural gas wells with transmission lines and other modifications), cumulative effects are greater. The following summarizes the resource values analyzed to determine cumulative effects on national trails.

Scenic Resources

- Cumulative effects resulting in the incremental modification to the integrity of the associated settings and scenic values for which the national trail was designated
- Cumulative effects on the naturally appearing landscapes associated with national trails, regardless of scenic quality rating

Historic and Cultural Resources

- Cumulative effects on historic/cultural resources, including the loss of cultural artifacts, features, or sites that could have cultural significance or could yield important information about the National Trail
- Cumulative impacts on the trail's setting and those characteristics that support the trail setting

Recreation (including travel management)

- Cumulative effects on high-quality recreation opportunities; relative freedom from intrusion; opportunities for vicarious experiences; and conservation, protection, and restoration of national trail resources, qualities, values, and associated settings
- Cumulative effects on desired recreation setting characteristics
- Cumulative effects on the primary use or uses of the national trail
- Cumulative effects on the travel systems in the area, including permanent access that could generate more movement in areas that would not have previously been accessible

Natural Resources and Other Landscape Elements

- Cumulative effects on natural resources (biological, geological, and scientific) relate to ground disturbance and the resulting loss of biological, geological, or other scientific resources
- Cumulative effects on the natural settings that are the geographic extent of the natural landscape elements that influence the trail experience and contribute to resource protection

4.3.19.2 Existing Condition

4.3.19.2.1 Continental Divide National Scenic Trail

The alignment for the Continental Divide NST was modified based on analysis completed for the Sierra Madre-Chokecherry Wind Farm Project, which would have dominated the setting and experience of the scenic trail along its former alignment adjacent to Wyoming Highway 71. Based on these potential effects, the Continental Divide NST was relocated farther to the west between Atlantic Rim and Coal Mine Ridge into an area with fewer existing cultural modifications. Due to the topographic screening afforded by these two ridges, views of the wind farm to the east and areas leased for oil and gas development to the west would be mostly screened from hikers using the new trail centerline. In the location where the trail descends into Eightmile Lake Basin, adjacent to other recreation opportunities, the setting would be modified through the construction and operation of the Sierra Madre-Chokecherry Wind Farm.

4.3.19.2.2 Old Spanish National Historic Trail

Adjacent to the congressionally designated alignment and trail traces for the Old Spanish NHT, development has modified the experience of the historic trail but these features do not dominate the setting. In particular for the Book Cliffs Analysis Unit, existing development is associated with I-70, several pipelines paralleling I-70, areas leased for oil and gas development by the State of Utah and the BLM Moab Field Office, and intermittent industrial development. Farther to the west, in the San Rafael Swell Analysis Unit of the Old Spanish NHT, there are fewer existing modifications than the Book Cliffs Analysis Unit. An existing transmission line has modified the character of adjacent areas; but due to the smaller scale and construction materials (wood), the existing transmission line does not dominate the setting for the trail in the San Rafael Swell, though the natural integrity of portions of the trail have been compromised. The State of Utah has leased areas for oil and gas development in the state-administered parcels adjacent to the Old Spanish NHT, which if developed, would further modify the trail's setting.

4.3.19.2.3 Overland Historic Trail

As described in Chapter 3, there are two alignments for the Overland Historic Trail under feasibility study that diverge south of Rawlins: (1) the northern option turns north and parallels Wyoming Highway 71 toward Rawlins and (2) the southern option continues to the west toward Fort LaClede. The northern option is located adjacent to Wyoming Highway 71 where existing development has influenced the area, which will be further modified by the construction and operation of the Sierra Madre-Chokecherry Wind Farm. The southern option traverses an area heavily influenced by oil and gas development, as well as associated pipelines, which begin to dominate the trail's existing setting.

4.3.19.2.4 Cherokee Historic Trail

Similar to the Overland Historic Trail, two alignments are under feasibility study by the NPS: (1) the 1849 route that parallels Wyoming Highway 71 toward Rawlins and (2) the 1850 route that crosses Wyoming Highway 789 13 miles north of Baggs then crosses Flat Top Mountain before paralleling the Wyoming/Colorado border. Similar to the northern option of the Overland Historic Trail, the 1849 route would be located adjacent to existing development that has modified the trail's setting that on the construction and operation of the Sierra Madre-Chokecherry Wind Farm would further modify the trail's setting. The 1850 route first traverses an area modified by oil and gas development adjacent to Wyoming Highway 789 before ascending Flat Top Mountain. The area from Flat Top Mountain to Powder Rim, adjacent to the Wyoming/Colorado border, has few existing modifications except for a series of pipelines crossing Powder Rim into Cherokee Basin. These existing modifications influence, but do not dominate, the setting for the Cherokee Historic Trail though the local integrity of the setting has been compromised.

4.3.19.3 Results

4.3.19.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

Continental Divide National Scenic Trail

The area associated with the Continental Divide NST, potentially traversed by the Project, has limited existing development. To the north, the city of Rawlins and adjacent development has modified the resource values for this scenic trail. South of the Project area in the BLM Rawlins Field Office, the trail's values would be modified through the introduction of the Sierra Madre-Chokecherry Wind Farm directly adjacent to the trail alignment and the construction of the Gateway West Transmission Project. Future development, including all WYCO alternative routes for the Project, in addition to the TransWest Express Transmission Project, would introduce transmission line structures adjacent to the trail in the enclosed landscape associated with Coal Mine Draw where there are few visible intrusions. The right-of-way vegetation clearing associated with these proposed projects could result in geometric forms along the ground plane as well as affect shrubland riparian habitat and related values along Coal Mine Draw. However, if the proposed transmission lines were constructed using shared access, similar color treatments (all dulled grey steel structures) and spans between towers where matched, cumulative effects could be reduced. In addition to these transmission line projects, a proposed wind farm (Hogback Ridge) would be located adjacent to the Continental Divide NST that could alter the distinctive Atlantic Rim setting and its associated natural features as well as dominate views from recreation areas in Eightmile Lake Basin (including Rim Lake Recreation Area).

Motorists on Wyoming Highway 71, an access route for the Continental Divide NST and located in the Continental Divide NST SRMA, would experience views dominated by wind farms associated with the proposed wind farm and the Sierra Madre-Chokecherry Wind Farm being located on either side of the road. Even though no trail-associated cultural properties were identified as part of this study, the development of past, present, and future projects may affect future potential interpretation of cultural properties through degradation of the trail's setting.

Overland Historic Trail

Existing development in proximity to the northern option of the Overland Historic Trail (under feasibility study), adjacent to the Project, includes the Sierra Madre-Chokecherry Wind Farm, which will dominate views from the trail paralleling Wyoming Highway 71. Through development of the proposed Hogback Ridge (Whirlwind I) Wind Energy Project and other future actions, including all WYCO alternative routes, this area would be increasingly influenced by energy infrastructure that would degrade the trail's setting and dominate views from identified recreation areas. The inventory of cultural properties in this area has not yielded any trail-associated sites but through development of past, present, and future projects, the future discovery of important trail-associated cultural sites could be affected.

Oil and gas development, as well as associated pipelines, have modified the areas adjacent to the southern option of the Overland Historic Trail and all WYCO alternative routes through the introduction of industrial structures, a network of access roads, and vegetation clearing. These modifications are also visible from trail-associated cultural sites, including the Dug Springs Stage Station, Barrel Springs, Red Rock, Duck Lake Stage Station (intense adjacent existing development), and the Washakie Station (limited adjacent development) as well as trail-associated access routes (Wamsutter Road, Eureka Headquarters Road, and Duck Lake Road). The development of future actions including the Project, the TransWest Express Transmission Project, and the expansive Continental Divide-Creston Junction oil and gas field, the areas adjacent to the Overland Historic Trail in this portion of the BLM Rawlins Field Office have the potential to be dominated by industrial development.

Views from the Overland Trail Ruts Interpretive Site, along Alternative WYCO-D have been influenced by past projects, which may result in an industrialized landscape setting if these future projects were constructed. The development of these areas also has the potential to modify the narrow shrubland riparian zones through vegetation clearing associated with these projects, in particular on Alternative WYCO-C and Alternative WYCO-D along Barrel Springs Draw and Muddy Creek, respectively. However, if the proposed transmission lines were constructed using shared access, had similar color treatments (all dulled grey steel structures), and spans between towers where matched, cumulative effects could be reduced.

Cherokee Historic Trail

Cumulative effects on the 1849 route for the Cherokee Historic Trail (under feasibility study) are similar to the cumulative effects on the northern option of the Overland Historic Trail as these trails are located in proximity to each other.

The areas associated with the 1850 route for the Cherokee Historic Trail, adjacent to Alternative WYCO-D along Wyoming Highway 789, and the first trail crossing on Alternative WYCO-F located 2.5 miles west of Wyoming Highway 789 have been influenced by existing oil and gas development. Through the introduction of the Project along these alternative routes, the TransWest Express Transmission Project, and the development of the Continental Divide-Creston Junction oil and gas field, the area adjacent to the Cherokee Historic Trail has the potential to become visually compromised by industrial facilities, and would yield a landscape that has decreased scenic integrity.

The area farther to the west, where Alternative WYCO-C crosses the Cherokee Historic Trail and Shell Creek Stock Trail (a trail-associated access road), has been influenced by an existing pipeline corridor which include strong geometric vegetative patterns resulting from right-of-way vegetation clearing. These pipelines influence, but do not entirely define, the trail's setting nor dominate views from this area. Based on the potential development of the Project and the TransWest Express Transmission Project, the setting would likely exhibit an industrial character defined by tall, formal, and geometric lattice transmission structures. Alternative WYCO-B would parallel the Cherokee Historic Trail from 1 to 4 miles away for a distance of approximately 15 miles. A portion of this would occur adjacent to Hangout Road which provides access to the historic trail, in an area minimally modified by development except for an area of oil and gas wells on Flat Top Mountain. After paralleling the historic trail, Alternative WYCO-B would cross the trail in an area with a limited extent of existing development.

Since there is limited future development planned for this area, the introduction of the Project and the TransWest Express Transmission Project would modify and may begin to dominate views from portions of the trail located closest to these projects north of Hartt Cabin Draw. South of this area, views from McPherson Springs (a trail-associated cultural site) may become dominated by the introduction of the Project (Alternative WYCO-B) and the TransWest Express Transmission Project in addition to the existing oil and gas facility adjacent to the springs. To reduce cumulative effects on this site's trail-related setting, potential mitigation would be to locate both the Project and the TransWest Express Transmission Project farther to the west to increase opportunities to screen views of these projects.

The two other trail crossings associated with Alternative WYCO-F (at Sand Creek and Colloid Draw), as well as being located in proximity to Shell Creek Stock Trail and Sand Creek Road (trail access routes), would occur in areas with limited existing and planned future development. As such, the introduction of the Project and the TransWest Express Transmission Project has the potential to begin to dominate views at these trail crossings through the construction of tall transmission structures incongruent with the existing landscape character. However, if the proposed transmission lines were constructed using shared access, had similar color treatments (all dulled grey steel structures), and matched spans between towers, cumulative effects could be reduced.

In all areas located in proximity to the Cherokee Historic Trail, there is a potential cumulative effect on historic resources through the development of past, present, and future projects that may result in the loss of cultural artifacts, features, or sites that could yield important information about the trail.

4.3.19.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

Old Spanish National Historic Trail

There are two analysis areas for the Old Spanish NHT identified by the BLM, as described in Chapter 3 with all COUT BAX alternative routes sharing the same alignment in proximity to the Book Cliffs Analysis Unit. This area has been modified by I-70, pipelines adjacent to I-70, areas leased for oil and gas development, and intermittent industrial development that influences but does not compromise the setting for the Old Spanish NHT. Recreation-based views of the Old Spanish NHT setting occur along I-70 (partially designated as the Dinosaur Diamond Scenic Byway) and the associated rest areas/scenic overlooks, including the Harley Dome Rest Area and Overlook, Thompson Welcome Center, and Crescent Junction Rest Area. East of Green River along NHT II and III trail traces, areas permitted for oil and gas development by the BLM Moab Field Office have the potential to further influence the setting and views associated with the Old Spanish NHT through the introduction of industrial structures and a network of access roads. The further introduction of the Project and the TransWest Express Transmission Project into these areas would produce a landscape that may be viewed as industrial in nature.

To reduce cumulative effects on the Old Spanish NHT along this analysis unit, potential mitigation would include colocation of the two proposed transmission projects to the extent practicable. This would not only reduce impacts on the setting and views associated with the Old Spanish NHT but also would minimize effects on riparian vegetation corridors south of the Book Cliffs through reduced right-of-way vegetation clearing, and potential cultural resources that could be effected through a larger area of cumulative disturbance.

In the San Rafael Swell Analysis Unit, there are limited existing modifications except for a lower voltage transmission line paralleled by Alternative COUT BAX-B adjacent to a series of NHT II and III trail traces along Cottonwood Wash, a trail-related prehistoric and historic rock art site in Big Hole Wash as identified by the BLM’s NHT Inventory Project, and the Big Hole ACEC. Based on the potential development of areas leased for oil and gas wells by the State of Utah, this area has the potential to become more influenced by energy infrastructure. The introduction of the Project would further modify and dominate the trail setting and views from trail-associated resources in this area. There is also the potential for disturbance of riparian vegetation along Cottonwood Wash where the right-of-way would be cleared of vegetation.

The same existing transmission line is located adjacent to Alternatives COUT BAX-B and COUT BAX-C through Buckhorn Flat in an area of NHT II and III trail traces adjacent to the Wedge Overlook/Buckhorn Draw Scenic Backway and the newly constructed recreation kiosk at the turnoff to the Wedge Overlook. The existing transmission line does have an effect on the setting for the Old Spanish NHT in this area; but due to the scale of the structures and construction materials (wood), it is relatively benign in the setting. Through the introduction of the Project and the TransWest Express Transmission Project, this setting would be locally modified from the presence of large-scale lattice transmission structures (towers) and right-of-way vegetation clearing in evenly occurring pinyon-juniper woodland communities. The visibility of the right-of-way vegetation clearing would be most apparent from the Cedar Mountain Overlook, which has superior views over Buckhorn Flat. In addition to these proposed projects, development of the proposed Emery County wind farm would further effect the setting for the Old Spanish NHT in Buckhorn Flat by introducing a series of skylined structures on Cedar Mountain, which through their motion and shade and shadow patterns, would attract views from adjacent recreation areas.

The setting along U.S. Highway 6 (designated as the Dinosaur Diamond Scenic Byway), adjacent to Alternatives COUT BAX-C and COUT BAX-E, has been altered by a lower voltage transmission line and railroad line. These features do have an influence on the setting but do not dominate views along this designated scenic travel route adjacent to the congressionally designated alignment of the Old Spanish NHT. Development of the Project, the TransWest Express Transmission Project, and the Twin Bridges oil and gas field would result in the local setting viewed as being primarily for energy usage. The local setting would then exhibit a strong industrial character for this segment of the Old Spanish NHT. To reduce cumulative effects on views from U.S. Highway 6 and the trail setting, potential mitigation would include colocation of the two proposed transmission lines as close to the Book Cliffs landscape as practicable. By locating these projects closer to the Book Cliffs, the geometric lines and complex shade and shadow patterns associated with dull grey steel lattice would readily be absorbed by the horizontal lines and banding color of the landforms. It is important to note that no trail traces were identified in this area through the BLM’s NHT Inventory Project.

Similarly, Alternative COUT BAX-C would parallel the Green River Cutoff Road in an area with limited existing modifications. The Green River Cutoff Road provides access into the San Rafael Swell and may be viewed as associated with the Old Spanish NHT due to its proximity to the congressionally designated alignment of the trail. Through the addition of the Project, the TransWest Express Transmission Project, and Twin Bridges oil and gas field, views of this area would become dominated by industrial development including energy-related structures, a network of access roads, and geometric clearing of pinyon-juniper vegetation. To minimize cumulative effects on these views, the two proposed transmission projects could be colocated farther to the north where existing terrain would begin to screen views of the projects from the Green River Cutoff Road. If the transmission lines were constructed using shared access, had similar color treatments (all dulled grey steel structures), and matched spans between towers, cumulative effects could be reduced further.

4.3.19.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

Since no designated NHT, NST, or trails undergoing a feasibility study for inclusion with the National Trails System are adjacent to the COUT alternative routes, this section is not pertinent for analysis of the Project.

4.3.20 Cultural Resources

Over time, cultural resources are subject to attrition as cultures change and sites weather and erode. In addition, prior development in the region has either degraded or resulted in the loss or discovery of some cultural resources. The addition of the Project to past and present actions and RFFAs would result in the greater potential for effects on cultural resources throughout the Project area.

The geographic scope of analysis for cultural resources is defined as a 4-mile-wide study corridor centered on the reference centerlines (similar to the methodology identified in Section 3.2.20). Cumulative effects on cultural resources would occur over the life of the Project and other current and future projects, including direct effects during construction and indirect effects during operation and maintenance activities. Disturbances from future developments and ground-disturbing activities could uncover or destroy unrecorded cultural resource sites. Despite the potential for adverse effects on some sites, future actions proposed on federal and/or state lands would require cultural resource evaluations and mitigation of affected significant historic properties prior to implementation. The resulting cultural resource documentation would increase the cultural resources knowledge base for the overall region; however, developments solely on private land are largely exempt from this requirement. Cumulative effects would be analyzed over the duration of the life of the Project.

The approach for analysis of cumulative effects on cultural resources, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the assessment of direct and indirect impacts from the Project (refer to Section 3.2.20) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.20.1 Issues Identified for Analysis

The majority of present and future actions that could have cumulative effects on cultural resources are associated with oil and gas development, mining/mineral exploration, transportation, utility corridors, renewable energy (e.g., wind and solar) development, and parks and recreation.

Other present and reasonably foreseeable future projects that could have cumulative effects on cultural resources along the proposed alternative routes (Tables 4-1 and 4-2) include, but are not limited to:

- PacifiCorp Seven Mile Hill Wind-Energy Facility (Wyoming)
- Continental Divide-Creston Natural Gas Project (Wyoming)
- Blue Mountain Energy Deserado Mine Project (Colorado)
- Uinta Natural Gas Development Project (Utah)
- TransWest Express Transmission Project (multi-state)
- Hiawatha Regional Energy Development Project (multi-state)
- Newfield Exploration Company Monument Butte Area Oil and Gas Development Project (Utah)
- the Victory Pipeline Project (Utah)
- Bill Barrett Corporation Blacktail Ridge Project (Utah)

4.3.20.2 Results

4.3.20.2.1 Cumulative Impacts on Cultural Resources Common to all Alternative Routes

Cumulative effects from direct impacts associated with the construction and operation phase of the Project would be similar for any of the alternative routes. Cultural resources could be destroyed by construction activities such as clearing, grading, drilling, and substation development. Development of new access corridors and rights-of-way could increase access to previously inaccessible areas, leading to potential vandalism of cultural resource sites. There also could be cumulative effects from indirect impacts in the form of introduced visual, atmospheric, and audible elements that could detract from the cultural significance of potential TCPs or other significant cultural resources. These indirect impacts also could adversely affect cultural resource sites that are eligible, or have the potential to be listed on the NRHP. The introduction of additional development could alter the setting and feeling of historic properties (e.g., habitation structures, open architectural sites, waterworks, and rock art).

As a result of the presence of existing development projects and proposed future actions, including, but not limited to the TransWest Express Transmission Project, cultural resources and potentially significant cultural resources that may be encountered could be affected negatively throughout the study corridor. If colocated, the TransWest Express Transmission Project could have a negative impact on many of the same cultural resources that would be affected by the Project.

Overall, the addition of the Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources. Some of these are:

- Prehistoric habitation and rock art sites, the Cherokee and Overland historic trails, the Rawlins to Baggs Stage Road, the Lincoln Highway, and 3 NRHP-listed properties (Fort Fred Steele Historic Site, Red Rock Site, and Hanna Community Hall) along the WYCO alternative routes
- Old Victory Highway along the WYCO and COUT alternative routes
- Prehistoric habitation and rock art sites, the Old Spanish NHT, the Dragon to Rangely Stage/Freight Road, the Dragon Douglas trail, the Uintah Railway, 27 NRHP-listed properties (including the Canyon Pintado National Historic District, Carrot Men Pictograph Site, and the Buckhorn Wash Rock Art), and 5 ACECs (Big Hole, Cottonwood Canyon, Grassy Trail, Smith Cabin, and Tidwell Draw) along the COUT BAX alternative routes
- CCC structure/features, the U.S. Highway 6, the Buckhorn Flat Railroad, and the D&RGW Railway along the COUT BAX and COUT alternative routes

- Prehistoric habitation and rock art sites, 23 NRHP-listed historic properties, a TCP (Ute vision quest site), Argyle Canyon Rock Art, and Nine Mile Canyon ACEC along the COUT alternative routes.

For the Little Denmark Heritage District (MPNHA) and areas adjacent to the Book Cliffs and Nine Mile Canyon and its tributary canyon branches in Utah, there is a high potential for encountering numerous unrecorded archaeological (prehistoric and historic) and historic sites.

The extent of cumulative effects on cultural resources could be reduced significantly through avoidance and implementation of selective mitigation measures. Potential impacts on cultural resources in the area would be incremental and the potential to mitigate impacts on cultural resources is good. The indirect cumulative effects on cultural resources, as a result of increased public access, would be expected to be low.

4.3.21 Fire Ecology and Management

The approach for analysis of cumulative effects on fire ecology and management, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.21.5) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

The cumulative effects analysis area for fire ecology and management is the same as the Project area. The potential cumulative effects of the Project that may be shared with the effects of the past and present actions and RFFAs listed in Tables 4-1 and 4-2 are discussed in general, as they may occur at nearly any location in the Project area.

4.3.21.1 Issues Identified for Analysis

4.3.21.1.1 Potential Impacts on Fire Risk

The Project would contribute to the ongoing, widespread human-caused changes in fire ecology throughout the Project area. Many past and present actions and RFFAs listed in Tables 4-1 and 4-2 can affect fire frequency and intensity through changes in vegetation cover and may increase the risk of fire ignition.

4.3.21.1.2 Potential Impacts on Wildland Fire Suppression at Wildland-urban Interface

The existing wildland-urban interface creates a complex, challenging environment for wildland fire suppression where human safety, property, and infrastructure are at the highest risk. Ongoing and future activities, including the proposed Project, are expected to continue to expand the wildand-urban interface and increase values to be protected during wildland fires.

4.3.21.2 Existing Condition

Past and present activities listed in Table 4-1 have modified fire ecology directly and indirectly throughout the CIAA. Agriculture, urban and rural residential developments, oil and gas production, and other activities have all contributed to a complex, expanding wildland-urban interface. Some of these activities, such as agriculture and oil or gas development, have a higher risk of spreading invasive weeds and altering fire ecology. Other activities, such as rural residential development, create substantial values to be protected during wildland fires while increasing the risk to health and safety. The impact of all of these activities is to create an environment where management of fire for the benefit of resources may be highly constrained, but where the absence of fire over long time periods increases the risk that when fires do occur, fuel loads and fire intensity are often unnaturally high and suppression may be very difficult.

4.3.21.3 Results

4.3.21.3.1 Cumulative Effects on Fire Ecology and Ignition Risk

As discussed in Section 3.2.21, human activities such as agriculture have a very high potential to spread invasive plants that may alter fire ecology. However, all cumulative activities identified in Tables 4-1 and 4-2 that cause ground disturbance or have the potential to transport the seeds of invasive plants also have some potential to contribute to further changes in the natural fire regime. Transmission lines and gas pipelines create long, linear corridors that may facilitate the local spread of invasive plants, and the Project would potentially contribute to the cumulative effects on fire ecology of all other past and present actions and RFFAs through this mechanism.

Some FMPs provide information on wildland fire causes in FMUs crossed by the Project. Where provided, this information indicates that, while wildland fires in FMUs with little development are typically ignited by lightning, fires in FMUs with an extensive wildland-urban interface may be ignited by human causes more often than by lightning. Insufficient information is available to discuss whether certain types of development are more likely than others to increase the risk of human-caused wildland fires, but increasing development in general is expected to continue to increase the cumulative risk. Construction of the Project and RFFAs would increase the number of roads, create new roads in areas previously without access, and contribute incrementally to the potential for accidental wildland fire ignitions.

4.3.21.3.2 Cumulative Effects on Fire Suppression

Human safety is the overriding concern of all wildland fire suppression activities. Secondary to safety concerns, protection of resources and property are considered when developing management objectives and allocating response personnel or equipment for each wildland fire. Past and present developments and linear utilities, when adjacent to burnable vegetation, can affect the response to a wildland fire. Existing roads and new roads created for future developments, potentially including the proposed Project, may provide access for ground crews, but protection of buildings and utilities may divert efforts from containment or suppression elsewhere. Construction of the Project and any RFFAs, including additional transmission lines, would further increase these effects.

As discussed in in Section 3.2.21, overhead utilities such as transmission lines pose a direct hazard to fire suppression personnel through the risk of equipment failure during a fire or through arcing where the increased moisture and particles in smoke can carry electrical currents. Overhead utilities also create a hazard to aircraft responding to a fire. These risks may be mitigated by constructing multiple utilities in a shared corridor, minimizing the total area where hazards to ground crews and aircraft are present.

4.3.22 Social and Economic Conditions

The approach for analysis of cumulative effects on socioeconomics, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.22) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.22.1 Issues Identified for Analysis

Socioeconomic issues that could be cumulatively affected by the Project and past, present, and future actions include recreational values and visitor spending, housing and public services, impacts on environmental justice populations, property values, and future business and industrial activity.

4.3.22.1.1 Effects on Recreational Values and Local Tourism

The development and operation of the transmission line could diminish the natural appearance and the undeveloped character of recreation areas, which could have detrimental effects on recreation values. Additional industrial and commercial development also could adversely affect these resources, cumulatively affecting recreational values. If visitation were to decrease due to the presence of the transmission line and other industrial development, this potentially could affect visitor spending and the local economy.

4.3.22.1.2 Availability of Employment and Housing for Local Workforce

Transmission line construction activity would expand regional economic development through increased employment and income in the region. As construction workers spend their money in the local area, revenues would likely increase for local businesses (e.g., hotels, restaurants, gas stations, and grocery stores), supporting jobs, and incomes for these businesses and their employees. In remote areas across the study area, it is likely that construction workers would live temporarily in nearby communities during construction. The potential for cumulative socioeconomic impacts on population, employment, and housing exist where there are multiple projects proposed in an area that have overlapping construction schedules and/or project operations that could affect similar resources. Concurrent and similar projects could result in a demand for labor that cannot be met by the region’s labor pool, which could lead to an influx of nonlocal workers. Socioeconomic resources potentially affected could include the availability of housing and accommodations as well as the availability of public and social services to accommodate the temporary workers.

4.3.22.1.3 Potential Impacts on Environmental Justice Populations of Concern

Potential environmental justice populations of concern residing in proximity to the transmission line routes could be affected cumulatively and adversely by the construction and/or development of other nearby projects with disproportionate impacts such as traffic, air quality, visual resources, cultural resources, property values, and agricultural land uses.

4.3.22.1.4 Potential Impacts on Private Property Values

Nearby residences to the transmission line may incur adverse effects on their property values. Additional nearby industrial construction and operations, such as other transmission lines, pipelines, oil and gas development, etc., may cumulatively affect these residential property values.

4.3.22.1.5 Potential Impacts on Local Businesses and Existing and Future Economic Development

Rangeland and cropland could be disturbed on private lands as well as in grazing leases on USFS- or BLM-administered land. Additional development in the Project right-of way, such as pipelines and other transmission lines, also could adversely affect these ranching resources. Additionally, the location of the development of new oil and gas wells would be restricted by the right-of-way, which may decrease oil and gas investment in certain locations with potential impacts on the local economies.

4.3.22.2 Existing Condition

The existing social and economic conditions are discussed in detail in Section 3.2.22.3.

4.3.22.3 Results

There are two types of effects that could have implications for cumulative effects on socioeconomic resources. Construction activity has the potential to affect temporarily socioeconomic resources, including recreational and scenic values, construction workforce effects on housing and public services, and property effects (e.g., traffic, dust). Industrial development and/or operations and activity in proximity to the Project, which causes long-term scenic, visual, or physical obstructions, could have implications for aesthetic and recreational values and residential property values and have the potential to restrict the location of future business or industrial development. The potential cumulative impacts associated with these activities could occur across the socioeconomic study area. Past, present, and future projects that could affect these resources are described in this section.

Environmental justice populations are expected to benefit from the Project through jobs, income, and fiscal receipts to local governments. These populations are not anticipated to be disproportionately and adversely affected by the Project. Therefore, the Project is not anticipated to cumulatively affect these populations.

4.3.22.3.1 Wyoming to Colorado – Aeolus to U.S. Highway 40 (WYCO)

There are a number of projects in the area that could result in cumulative effects in southwestern Wyoming and northwestern Colorado. The following projects have been identified that potentially have similar construction schedules and/or the industrial activity or development would occur in proximity to the Project.

Present or future construction and/or nearby industrial activity are expected for the following multi-state projects in this region in Wyoming and Colorado:

- Gateway West 500kV Transmission Project (multi-state)
- TransWest Express Transmission Project (multi-state)

Present or future construction and/or nearby industrial activity are expected for the following Wyoming projects in this region:

- Oil and gas development in southwestern Wyoming
- Wind-energy facility development (Chokecherry and Sierra Madre Wind Farm, Seven Mile Hill Wind Energy Facility, Dunlap I Wind Farm, Whirlwind I, Quaking Aspen Mountain, White Mountain Wind Farm, and Sweeney Ranch)
- Coal and noncoal mine development
- Residential developments

Present or future construction and/or nearby industrial activity are expected for the following Colorado projects in this region:

- Oil and gas development in northwestern Colorado
- Oil shale and tar sands development
- Coal and noncoal development projects
- Residential developments

Construction activity has the potential to affect temporarily properties, recreational and scenic values, and bring a temporary construction workforce to local communities, requiring housing and public services. It is possible that the construction associated with these present and future activities, including transmission, wind facilities, oil and gas resources, oil shale, and mining resources, would require similar construction schedules that may overlap with the Project. As a result, the construction schedules of the Project, when added to these schedules, could lead to cumulative effects. Some of these projects would be expected to draw on the regional construction workforce in southwestern Wyoming and western Colorado where there is a considerable supply of construction workers. The cumulative demand for laborers in construction would likely require additional workers to relocate temporarily from the Denver and Salt Lake City regions and possibly elsewhere to fill these positions. This would result in an increase in temporary population across this region and an increased demand on housing, services, and infrastructure including road maintenance, emergency services, and municipal and county resources.

The construction workers needed for all of these cumulative projects, along with those required for the Project, could add to stresses on housing, services, and infrastructure if construction schedules coincide, requiring considerable temporary workers residing in overlapping areas. Municipal and county services, including public service provisions such as education, road repair and construction, police and law enforcement, judicial facilities and services, medical services and facilities, emergency services, and other social services can all be expected to increase, driven by the growing workforce and population from numerous present and future projects, even if it is temporary in nature. Additionally, average earnings also may be driven up by higher-paying oil industry jobs.

The location of where these temporary residents would be housed is not known for this Project nor is it known for future development activities. The current rental housing market is close to capacity, and the cities and towns in southwestern Wyoming have very low rental vacancy rates. In addition, hotel, motel, and other lodging accommodations have high occupancy rates in the spring, summer, and fall, ranging from 72 to 90 percent (Rock Spring Chamber of Commerce 2015). In Wyoming where there are multiple existing and future wind facility developments occurring and expected in the foreseeable future near the communities of Aeolus, Hanna, Sinclair, Rawlins, and Wamsutter, it may be the case that these communities are at or very near maximum housing and accommodations capacity.

The transmission construction jobs associated with the proposed project would be a temporary impact on these communities, and permanent increases in residents to these areas are not expected to directly result from the proposed Project. In southwestern Wyoming, the cumulative effects could be considerable on housing and possibly public services, especially if the present and future cumulative construction schedules coincide with the construction schedule of the Project. During the construction period, the cumulative impacts associated with the proposed Project on housing and public services are expected to be short-term and adverse and could range from moderate to major depending on the availability and capacity of housing and accommodations. In addition, construction workers could also displace tourism visitors in small towns who rely on visitor spending to sustain their small economies during peak summer months.

However, construction workers staying in local communities do bring spending and revenues to local businesses, and perhaps this is more noticeable in places where tourism visitation is not prevalent. These temporary workers often bring their wages and spending to remote communities who welcome the stimulus to their economies. The cumulative beneficial impact of the Project on the social and economic conditions in the region could be considerable, including business revenues, employment, income, fiscal receipts, and increased electrical reliability. In addition, indirect cumulative effects range from increases in housing stock to job growth. If current trends continue, the economy in southwestern Wyoming will continue to grow, the population will increase, government services will expand, and the housing stock will increase. This project would not induce this growth; however, this Project would accommodate the increased demand that would be placed on the current electrical system.

The proximity of industrial or commercial activities to the Project could cumulatively affect property values, scenic and recreational values, and possibly affect the location of future business and commercial activity. Very few residential properties are located in proximity to Alternatives WYCO-B, WYCO-C, and WYCO-F (1 residences within 0.1 of a mile and 4 residences within 0.25 mile), resulting in minimal adverse effects on the property values associated with the Project. Alternative WYCO-D has 10 and 53 residences within 0.1 mile and 0.25 mile, respectively. Since property values are most affected within 0.25 mile or less of a transmission line or other industrial development, the specific siting of the Gateway West transmission line between Aeolus and Wamsutter and the TransWest Express Transmission Project between Rawlins and south to the Utah border in proximity to the Project would have the greatest potential to cumulatively affect these property values.

With the bulk of the Alternative WYCO-D nearby properties near Craig, Colorado, the siting of the TransWest Express Transmission Project along this alternative route and corridor may cumulatively adversely affect the nearby property values. Other wind power and oil and gas resource development could affect property values if located very near to the Project and residences although this is not likely to occur. Again, topography, landscaping, and visual obstructions may lessen these effects, and the property value effects tend to dissipate over time. The cumulative transmission line development and activity if sited along Alternative WYCO-D, when combined with the Project, would moderately and adversely affect these property values around Craig, Colorado, potentially affecting 53 residences within 0.25 mile. The remainder of the WYCO alternative routes would have minimal adverse impacts on residential property values.

With the bulk of Alternative WYCO-D nearby properties near Craig, Colorado, the siting of the TransWest Express Transmission Project along this alternative route and corridor may cumulatively adversely affect the nearby property values. Other wind power and oil and gas resource development could affect property values if located very near to the Project and residences although this is not likely to occur. Again, topography, landscaping, and visual obstructions may lessen these effects, and the property value effects tend to dissipate over time. The cumulative transmission line development and activity if sited along Alternative WYCO-D, when combined with the Project, would moderately and adversely affect these property values around Craig, Colorado, potentially affecting 50 residences within 0.25 mile. The remainder of the WYCO alternative routes would have minimal adverse impacts on residential property values.

Residential and commercial properties could be adversely affected by construction of other transmission lines, oil and gas and shale resources, wind power facilities, residential developments, and other transportation and industrial facilities from increased traffic, noise, dust, and other construction inconveniences. Construction activities associated with the Project and cumulative actions and activities also could affect temporarily and adversely scenic and aesthetic values with the potential to adversely affect visitor experiences and recreation values. Since construction activities are anticipated to be temporary, there would minimal short-term adverse impacts on properties and scenic and recreational values. However, when combined with multiple construction projects, these adverse effects could be more profound and extended for relatively longer periods of time. However, the Project’s contribution to these cumulative impacts would be short-term and minor.

The existence and operation of transmission lines also have the potential to displace future industrial and commercial development. However, the industrial restrictions would apply only to the right-of way, which would be at most 250 feet wide. The placement of new oil and gas wells potentially could be affected by the Project, although the location of the development of new wells would be constrained only by the right-of-way and the impacts would be low since the extraction of oil can usually occur from multiple locations in and above reserves.

4.3.22.3.2 Colorado to Utah – U.S. Highway 40 to Baxter Pass to Clover (COUT BAX)

There are a number of projects in the area that could result in cumulative effects in eastern Utah in proximity to the COUT BAX alternative routes. These projects have been identified with the potential to have similar construction schedules and/or the industrial activity or development would occur in proximity to the Project.

Present or future construction and/or nearby industrial activity are expected for the following multi-state projects in this region in eastern Utah:

- Enterprise Mid-America Pipeline Western Expansion II Project (multi-state)
- TransWest Express Transmission Project (multi-state)

Present or future construction and/or nearby industrial activity are expected for the following Utah projects:

- Oil and gas development
- Oil shale and/or tar sands development
- Pipeline development
- Transmission projects
- Wind-energy facilities (near Castle Dale)
- Coal and noncoal mine development
- Flatirons Resource Helium Well Project
- Industrial facilities (power) near Green River
- Pumped-storage transmission line project (near Mona)
- The Narrows Dam and Reservoir project
- Road developments
- Residential developments

Many of these effects would be the same as those described for the WYCO alternative routes. Only those aspects that are different for this region are described here.

Some of these present and future actions and projects would be expected to draw on the regional construction workforce in western Colorado where there is a supply of available construction workers, but most of the workforce would likely be coming from outside the region. The cumulative demand for laborers in construction would require workers to relocate temporarily from the Denver and Salt Lake City regions and possibly elsewhere to fill these positions. This would especially be the case in the communities further away from the Grand Junction area where construction workers would need to reside temporarily to support construction activities.

This would result in an increase in temporary population across this region and an increased demand on housing resources. The construction workers needed for all of these cumulative projects, along with those required for the Project, would add to stresses on housing, services, and infrastructure if construction schedules coincide, requiring an influx of temporary workers. Many of the communities in eastern and central Utah are small and remote, and a large influx of temporary residents may not be able to be accommodated in many of these small rural towns. The location of where these temporary residents would be housed is not known for this project nor is it known for future development activities. To the extent that housing and lodging in Grand Junction (Salt Lake City is likely too far away for the projects in these locations) could be used for temporary housing with perhaps greater capacity to absorb these residents and spreading workers' temporary residences across these towns and cities to diffuse the impact, this would mitigate the adverse effects on the availability of housing and public services. Other towns in this region have limited housing resources and accommodations availability.

The cumulative impacts associated with the proposed Project in addition to present and future actions and projects on housing availability are similar to those described for the WYCO alternative routes, with short-term and adverse impacts for housing and possibility public services, ranging from minor to major, depending on the current and future constraints of housing and accommodations and the timing and location of construction and project schedules in the towns along the alternative routes. In addition, construction workers could also displace tourism visitors in small towns who rely on visitor spending to sustain their small economies during peak summer months.

However, construction workers staying in local communities do bring spending and revenues to local businesses, and perhaps this is more noticeable in places where tourism visitation is not prevalent. The cumulative beneficial impact of the Project on the social and economic conditions in the Project area could be considerable, including business revenues, employment, income, fiscal receipts, and increased electrical reliability, as described for the WYCO alternative routes.

The proximity of industrial or commercial activities to the Project could cumulatively affect property values, scenic and recreational values, and possibly affect the location of future business and commercial activity. Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E have between 100 and 107 residences within 0.25 mile. Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E have 11, 11, and 14 residences within 0.1 of a mile, respectively.

Seventy-seven nearby residences (within 0.25 mile) are located very near Nephi, Utah. All COUT BAX alternative routes pass by these residences. The TransWest Express Transmission Project also is likely to be routed through this community with the potential to cumulatively affect property values in this neighborhood. Alternatives COUT BAX-B and COUT BAX-C traverse near 11 residences close to Mount Pleasant, Utah. This is also a corridor through which the TransWest Express Transmission Project also could be located.

Alternative COUT BAX-E is located in proximity to 10 residences near Fairview, Utah, which is also an alternate route being considered for the TransWest Express Transmission Project. Other oil and gas resource development and industrial facilities could affect property values if located very near to the Project and residences. Again, topography, landscaping, and visual obstructions may lessen these effects, and the property value effects tend to dissipate over time. The cumulative transmission line development and activity if sited along the COUT BAX alternative routes, when combined with the Project, could have a substantial adverse effect on property values, primarily around the communities of Nephi, Mount Pleasant, and Fairview.

Properties could be adversely affected by the construction activity associated with cumulative actions and projects from increased traffic, noise, dust, and other construction inconveniences. Since construction activities are anticipated to be temporary, there would be minimal short-term adverse impacts on properties and scenic and recreational values. However, when combined with multiple construction projects, these adverse effects could be more noticeable and extended for a relatively longer period of time. The Project's contribution to these cumulative impacts would be short-term and minor.

The existence and operation of transmission lines also have the potential to displace future industrial and commercial development. However, the impacts would be low since development would only be restricted to the right-of-way.

4.3.22.3.3 Colorado to Utah – U.S. Highway 40 to Central Utah to Clover (COUT)

There are a number of projects in the area that could result in cumulative effects in eastern and central Utah in proximity to Alternatives COUT-B, COUT-C, COUT-H, and COUT-I. These projects have been identified with the potential to have similar construction schedules and/or the industrial activity or development would occur in proximity to the Project.

Present or future construction and/or nearby industrial activity are expected for the TransWest Express Transmission Project (multi-state project) in this region in eastern and central Utah.

Present or future construction and/or nearby industrial activity are expected for the following Utah projects in this region:

- Oil and gas development
- Oil shale and/or tar sands development
- Pipeline development
- Transmission projects
- Coal and noncoal mine development
- Pumped-storage transmission line project (near Mona)
- The Narrows Dam and Reservoir project
- Road developments
- Residential developments

Many of these effects would be the same as those described for the Utah portions of the COUT BAX alternative routes. Only those aspects that are different for this region are described here.

The construction schedules of the Project, when added to the construction schedules of present and future actions and projects, could lead to cumulative effects. Some of these projects would be expected to draw on the regional construction workforce in Wasatch Front and the Salt Lake City suburbs where there is a supply of construction workers. The Project and cumulative demand for laborers in construction would likely require workers to relocate from the Denver and Salt Lake City regions to reside temporarily in the smaller towns along the routes in central and eastern Utah. This especially would be the case in the communities farther from the Salt Lake City urban area where construction workers would need to reside temporarily to support construction activities.

The construction workers needed for all of these cumulative projects, along with those required for the Project, would add to stresses on housing, services, and infrastructure if construction schedules coincide, requiring an influx of temporary workers. Many of the communities along the COUT alternative routes are small and remote, and a large influx of temporary residents may not be easily accommodated in many of these small rural towns. The location of where these temporary residents would be housed is not known for this Project nor is it known for future development activities. Vernal, Roosevelt, and Price, Utah are relatively larger communities along the COUT alternative routes. However, these communities have limited housing resources and lodging availability.

The construction of the Project would have temporary adverse effects on housing across the region. Impacts would range from minor to major depending on the availability of housing and lodging accommodations and constraints during the construction activity in the small and larger cities and towns near the alternative routes. When considering present and future cumulative actions and projects, the cumulative impacts on housing and possibly public services is expected to be short-term and adverse and range from minor to major, with more adverse effects when the construction schedules coincide temporally and geographically. In addition, construction workers could also displace tourism visitors in small towns who rely on visitor spending to sustain their small economies during peak summer months.

However, construction workers staying in local communities do bring spending and revenues to local businesses, and perhaps this is more noticeable in places where tourism visitation is not prevalent. The cumulative beneficial impact of the Project on the social and economic conditions in the Project area could be considerable, including business revenues, employment, income, fiscal receipts, and increased electrical reliability, as described for the WYCO alternative routes.

The proximity of industrial or commercial activities to the Project cumulatively could affect property values, scenic and recreational values, and possibly affect the location of future business and commercial activity. Similar to the analysis for the COUT BAX alternative routes, all of the COUT alternative routes pass by within 0.25 mile of 77 residences near Nephi, Utah. The TransWest Express Transmission Project also is likely to be routed through this community with the potential to cumulatively affect property values in this neighborhood.

All COUT alternative routes have between 12 and 56 residences within 0.1 of a mile, and 100 to 239 residences within 0.25 mile. Alternative COUT-A has the greatest number of residencies located within 0.25 mile, located near Strawberry Reservoir, Fruitland, Duchesne, and Roosevelt, a total of 214 residences. Alternative COUT-B has 239 residences within 0.25 mile, the majority of which are located in Roosevelt and southwestern Duchesne County. Alternative COUT-C has nearby residences in southwestern Duchesne County. The TransWest Express Transmission Project has alternative routes located along Alternatives COUT-A, COUT-B, and COUT-C (although a portion of Alternative COUT-B between Roosevelt and southwestern Duchesne county is not included in the TransWest Express alternative routes) with the potential to cumulatively affect these property values.

Alternative COUT-I has 101 nearby residences within 0.25 mile of the Project, some of which are located in southwestern Duchesne County. Alternative COUT-H has 141 nearby residences within 0.25 mile of the Project, some of which are located in southwestern Duchesne County and near Helper, Utah. These residences are also along the alternative routes being considered for the TransWest Express Transmission Project.

Other oil and gas resource development and industrial facilities could affect property values if located very near to the Project and residences. Again, topography, landscaping, and visual obstructions may lessen these effects, and the property value effects tend to dissipate over time. The cumulative transmission line development and activity if sited along the COUT alternative routes, when combined with the Project, could have a substantial adverse effect on property values. Residences close to the following communities would be affected—Nephi (all COUT alternative routes), Roosevelt (Alternatives COUT-A and COUT-B), Upalco (Alternative COUT-A), Duchesne (Alternative COUT-A), Fruitland (Alternative COUT-A), Helper (Alternative COUT-H), Fairview (Alternative COUT-H), and southwestern Duchesne County (Alternatives COUT-B, COUT-C, COUT-H, and COUT-I).

Properties could be affected adversely by construction of cumulative actions and from the Project due to increased traffic, noise, dust, and other construction inconveniences. Since construction activities are anticipated to be temporary, there would be minimal short-term adverse impacts on properties and scenic and recreational values. However, when combined with multiple construction projects, these adverse effects could be more profound and extended for a relatively longer period of time. The Project's contribution to these cumulative impacts would be short-term and minor.

The existence and operation of transmission lines also have the potential to displace future industrial and commercial development. However, the impacts would be low since development would only be restricted to the right-of-way.

4.3.23 Public Health and Safety

As a result of changes to the Project description for the Energy Gateway South Transmission Project, principally the structure types for the Project, public health and safety analyses previously prepared for the Draft EIS was revised for the Final EIS to accurately reflect the current Project description. These analyses will be provided to the Agency Interdisciplinary Team and cooperating agencies when completed and included in the Final EIS.

The approach for analysis of cumulative effects on public health and safety, including the geographic and temporal scopes defined for analysis, is presented in Table 4-3. This analysis relies on the analysis of direct and indirect impacts from the Project (refer to Section 3.2.23.5) and considers them in conjunction with the past and present actions and RFFAs listed in Tables 4-1 and 4-2.

4.3.23.1 Issues Identified for Analysis

Three issues were identified for which additional analysis of the potential cumulative effects of the operation of the proposed 500kV transmission line is required. For each of the issues, the question is whether operation of the proposed transmission line in proximity to other transmission lines would cause cumulative effects (i.e., the combined EMF, radio noise, and audible noise levels would rise above levels with a potential to produce adverse effects or device interference [EMF, radio noise] or annoyance [audible noise]).

4.3.23.1.1 Electric and Magnetic Field Effects on Humans and Animals

EMF is produced by transmission lines, distribution lines, and all electrical devices supplied with electricity. Comparisons of calculated levels of EMF from the proposed 500kV transmission line to health-based exposure guidelines and an assessment of relevant literature did not identify any likely effects of EMF exposure on human or animal health.

4.3.23.1.2 Radio Noise Effects on Cellular Phone, Internet, Radio, or Television Reception

Radio noise from the proposed 500kV transmission line was calculated and found to be below recommended levels and not likely to be a source of interference to electrical devices, except to amplitude-modulated radio reception on the right-of-way.

4.3.23.1.3 Audible Noise Annoyance to Area Residents

Audible noise from the proposed 500kV transmission line was calculated and found to be below EPA-recommended levels on and beyond the right-of-way and not likely to be a source of annoyance to residents in proximity to the line.

4.3.23.2 Existing Condition

Thousands of miles of high-voltage AC and DC transmission lines exist (Table 4-1), some of which may traverse the Project study area (Table 4-2). The levels of EMF, radio noise, and audible noise from these transmission lines are judged to be higher than other existing or potential sources identified; therefore, the focus of this analysis is on interactions of the proposed transmission line with these other transmission lines that might yield significant cumulative effects.

4.3.23.3 Results

The potential cumulative effects of EMF, radio noise, and audible noise with existing and proposed transmission lines were analyzed and the results are summarized in Table 4-3. As discussed below, no significant cumulative effects for these exposures were identified.

4.3.23.3.1 Past and Present Activities

Section 3.2.23 evaluated the proposed 500kV transmission line where it might parallel three existing AC transmission lines for significant distances (the interactions between transmission lines that cross over or under one another are negligible and highly localized). When located on separate but adjacent rights-of-way, the new transmission line was calculated to produce very small increases in the levels of EMF, radio noise, and audible noise such that the potential total impact of these adjacent sources (the Mona-Bonanza 345kV transmission line and two 138kV transmission lines—Spanish Fork to Carbon and Hayden to Artesia) would still be well below the designated guideline values for these exposures. It is important to understand that depending on the orientation, loading, and phasing of the conductors, the EMF from adjoining lines as vectors may result in EMF levels at locations that are higher (additive effect) or lower (partial cancellation effect) than the EMF from an existing or proposed transmission line alone. Nevertheless, despite the potential additive effect of two adjacent transmission lines, the total effect in the area between the transmission lines is calculated to always be less than in the area directly under the conductors of either transmission line.

Given that distances from centerlines to the edge of the rights-of-way are no less than 75 feet at 345kV, appropriately less for lower voltages, and a minimum of 112.5 feet for the only existing 500kV transmission line (Mona to Oquirrh), this assessment also applies to other existing AC transmission lines in the Project area (Table 4-3) operating at voltages from 20kV up to 345kV. Adding these distances to the 125 feet from the centerline of the proposed Gateway West transmission line to the edge of the right-of-way translates to a minimum separation distance of 200 feet between the proposed 500kV transmission line and existing transmission lines at greater than or equal to 345kV. If the proposed transmission line crosses such existing transmission lines, the potential affected area would be confined to a limited area of the right-of-way. In addition, combined effects of EMF, radio noise, and audible noise would be minimized by the additional height above ground required for the proposed 500kV transmission line to cross above an existing transmission line.

4.3.23.3.2 Reasonably Foreseeable Future Actions

In the Project area, the two transmission lines with the highest voltages and longest lengths are the proposed Gateway West 500kV AC transmission line and the proposed TransWest Express 600kV DC transmission line (Table 4-135). It is clear from the modeling of total EMF from the proposed 500kV transmission line adjacent to the Mona to Bonanza 345kV transmission line (Appendix O, Figures O-2 and O-6) that if the 345kV transmission line were to be replaced with the proposed 500kV transmission line, the combined EMF levels at the edges of the rights-of-way would not exceed recommended guideline reference levels determined by the ICNIRP and the ICES. Thus, if the proposed 500kV transmission line were to parallel the proposed Gateway West 500kV transmission line, the cumulative effect would be very small and no adverse effects would be expected.

TABLE 4-135
PUBLIC HEALTH AND SAFETY CUMULATIVE EFFECTS ANALYSIS

Jurisdiction/Agency	Applicant	Project Name	Significant Cumulative Effect (Yes/No)
Multi-State Activities			
Past and Present Activities[1]			
Bureau of Land Management (BLM) Fillmore Field Office	PacifiCorp	Mona to Oquirrh Transmission Project	No
	Intermountain Power Agency	Intermountain Mona Lines No. 1 and 2	No
	PacifiCorp	Camp Williams to Sigurd No. 1	No
	PacifiCorp	Camp Williams to Sigurd No. 2	No
LANDFIRE™	–	Transmission lines throughout the Project area	No
Reasonably Foreseeable Future Activities			
BLM Wyoming State Office	Idaho Power and Rocky Mountain Power	Gateway West 500-kilovolt (kV) Transmission Project	No
BLM Wyoming State Office	TransWest Express, LLC	TransWest Express 600kV Transmission Project	No
Utah			
Federal			
BLM Fillmore Field Office	–	Mona North Pumped Storage Project	No
BLM Fillmore Field Office	–	Mona South Pumped Storage Project	No

NOTE: Past and Present Activities include authorized activities that may or may not have been built to date but could be built at anytime

If the proposed 500kV line were to operate on a right-of-way adjacent to the proposed TransWest Express transmission line, cumulative EMF effects would be even smaller because the 60-Hertz EMF from the AC transmission line and the 0-Hertz EMF from the DC transmission line will not combine such that guidelines for AC EMF or for DC EMF would be exceeded. The only interaction of the EMF from adjacent AC and DC transmission lines is the possibility of enhanced perception of the AC electric field in the presence of DC electric fields and air ions, but the distance between the conductors of the proposed 500kV AC transmission line and the TransWest Express transmission line would always be at least 150 feet (based on data in Table 4-2), so the effects of the two lines would not be cumulative (Chartier et al. 1981; Clairmont et al. 1989). Of the five potential future projects identified in Table 4-3, the minimum distance from the centerline to the edge of the right-of-way is 125 feet for four projects, which translates to a minimum separation distance of 250 feet from the proposed 500kV transmission line.

The analysis of audible noise and radio noise for existing and proposed transmission lines is similar to that presented above for EMF. Of note, the distances from the proposed 500kV transmission line evaluated here are similar to or greater than the critical distances for control of effects on audible noise identified in the Final EIS for the Gateway West transmission line (BLM 2011j). The opportunity for cumulative effects is slightly greater than for EMF, however, because of the slower diminution of audible noise and radio noise with distance compared to diminution of EMF with distance from transmission line conductors.

The area of principal interest for the assessment of potential cumulative effects for audible noise and radio noise, however, is not on the rights-of-way of the transmission lines, but at residences away from the transmission lines. When two transmission lines are located on parallel, adjacent rights-of way, the area with the greatest cumulative effect will be the small area on each right-of-way and between adjacent rights-of-way edges where the audible noise or radio noise from one transmission line adds to that from the other. Since no residences would be located in this area, the areas of concern where the use and enjoyment of property free from unacceptable audible noise or radio noise are limited to the opposite sides of the rights-of-way, where the influence of the adjacent transmission line is exceedingly small. If the proposed transmission line were to cross any of these future transmission lines, the potential area affected would be confined mostly to a limited area of the right-of-way and combined effects of EMF, radio noise, and audible noise would be reduced by the additional height aboveground required for the proposed 500kV transmission line to cross above an existing transmission line.

4.4 Irreversible and Irretrievable Commitment of Resources

Resources committed to the proposed Project would be material and nonmaterial, including financial resources. Irreversible commitment of resources for the purposes of this section has been interpreted to mean that those resources once committed to the proposed Project would continue to be committed throughout the life of the Project (50 years) or longer if the Project was not decommissioned. Irretrievable commitment of resources has been interpreted to mean that those resources used, consumed, destroyed, or degraded during construction, operation, maintenance of the proposed Project could not be retrieved or replaced for future use. Irreversible and irretrievable commitments of resources for the Project are summarized in Table 4-136.

TABLE 4-136
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resource	Type of Commitment	Reason for Commitment	Irreversible	Irretrievable
Air quality	▪ Degradation of air quality	▪ Construction activities	No	Construction phase
Soils	▪ Soil loss and erosion	▪ Construction activities	Yes	Yes
Water	▪ None (refer to construction materials section)	–	–	–
Biological	▪ Disturbance to and/or loss of vegetation, habitat, and wildlife species	▪ Construction and operation	Yes	Project life
Archaeological and historical sites	▪ Disturbance or removal of sites	▪ Construction, operation, and maintenance	Yes	Yes
Important cultural sites	▪ Disturbance or removal of sites, interference with visual setting	▪ Construction, operation, and maintenance	Yes	Project life
Traditional cultural properties	▪ Disturbance or removal of sites, interference with visual setting, aural disturbance	▪ Construction, operation, and maintenance	Yes	Project life Construction phase
Paleontological resources	▪ Disturbance or removal of fossils	▪ Construction activities	Yes	Yes
Visual resources	▪ Degradation of natural scenic quality, viewshed intrusion	▪ Construction and operation	Yes	Project life

TABLE 4-136
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Resource	Type of Commitment	Reason for Commitment	Irreversible	Irretrievable
Land use and recreation resources	▪ Disturbance to agriculture and grazing	▪ Exclusion of residential, institutional, and industrial uses ▪ Increased recreational use along new access roads ▪ Increased access construction ▪ Construction and operation	Yes	Project life
Public health	▪ Potential adverse electrical effects	▪ Operation	Unknown	Unknown
Noise	▪ Noise exceeding ambient levels	▪ Construction and operation	Yes No	Construction phase
Social and economic conditions	▪ Increased regional and local employment and revenues	▪ Construction and operation	Yes	Project life
Construction materials and fuels	▪ Use of:	–		
	• Aggregate		Yes	Yes
	• Water		Yes	Yes
	• Steel		Yes	No
	• Aluminum		Yes	No
	• Concrete		Yes	Yes
	• Wood		Yes	No
	• Fossil fuels		Yes	Yes

Chapter 5
Land-use Plan Amendments

CHAPTER 5 – LAND-USE PLAN AMENDMENTS

As proposed, the Project would cross three states—Wyoming, Colorado, and Utah—including federal lands administered by 10 BLM field offices (Rawlins, Little Snake, White River, Grand Junction, Vernal, Moab, Price, Salt Lake, Richfield, and Fillmore Field Offices) and three national forests (Ashley, Uinta-Wasatch-Cache, and Manti-La Sal National Forests). Both the BLM and USFS planning regulations (43 CFR 1610.5 and 36 CFR 219.10) require that site-specific decisions, including authorized uses of land, be consistent with the applicable plan. If a proposed site-specific decision is not consistent with the applicable plan, the responsible official may modify the proposed decision to make it consistent with the plan, reject the proposal, or amend the plan to authorize the action. As a result, the amendment of multiple BLM RMPs and USFS LRMPs (land use plan amendments [LUPAs]) may be necessary before the project can be authorized.

For some specific portions of the Project along alternative routes, where avoidance was not possible or where application of all feasible mitigation measures was determined through project-specific analysis to be insufficient to bring the Project into conformance with the administering federal agency’s land-use plan, a LUPA would be required to amend decisions in the land-use plans to accommodate the Project. Each nonconformance potentially caused by the Project’s alternative routes was identified through a comparison of the Project’s alternative route(s) to the respective land use plan. A LUPA that would allow plan consistency with authorization of the alternative route(s) is presented as the potential LUPA for that situation. LUPAs would be implemented only for the Project-specific selected route.

The discussion in this chapter describes the process for amending BLM- and USFS-land use plans and identifies proposed LUPAs to authorize the selected route, as well as other proposed LUPAs required should another route ultimately be selected for construction, followed by an analysis of the potential environmental impacts associated with each LUPA. The locations associated with the proposed LUPAs are presented on Maps 5-1a and 5-1b.

5.1 Planning Process

The BLM prepares RMPs for public lands in accordance with the requirements of FLPMA Sections 201 and 202 (43 U.S.C. 1711-1712) and the regulations in 43 CFR 1600. The BLM Land Use Planning Handbook (BLM Manual H-1601-1) provides specific guidance for preparing, amending, revising, and maintaining BLM land use plans (BLM 2005a). The BLM’s land use planning regulations at 43 CFR 1610.5-5 state, “an amendment shall be initiated by the need to consider a Proposed Action that may result in a change in the scope of resources uses or a change in the terms, conditions, and decisions of the approved plan.” Plans needing amendment may be grouped geographically or by type of decision in the same amendment process. One amendment process may amend the same or related decisions in more than one land use plan. An overview of the NEPA and land-use plan amendment process is presented in Section 1.5.

The Project-specific amendments to USFS LRMPs to authorize the selected route are proposed under the 1982 planning rule procedures. The USFS land use planning regulations at 36 CFR 219.13 state, “a plan amendment is required to add, modify, or remove one or more plan components, or to change how or where one or more plan components apply to all or part of the plan area (including management areas or geographic areas).” As provided under 36 CFR 219.17(b)(2), the amendment procedures being followed for the proposed LUPAs are those in the provisions of the 1982 planning regulations (36 CFR 200-299, 7-1-2000 Edition). Under those prior planning regulations, “the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures.”

5.1.1 Summary of Changes from the Draft Environmental Impact Statement

Chapter 5 was updated to reflect adjustments in the alternative route alignments and their effect on the scope and/or environmental consequences of LUPAs to authorize the Proposed Action, and to address comments received during public review of the Draft EIS. For LUPAs to authorize the route of the Agency Preferred Alternative, these are now considered proposed plan amendments in the Final EIS. The LUPAs identified on other alternative routes reflect proposed plan amendments should another alternative route ultimately be selected for construction.

Substantive changes made between the Draft and Final EIS are demarcated on the left margin of the chapter by a vertical black line.

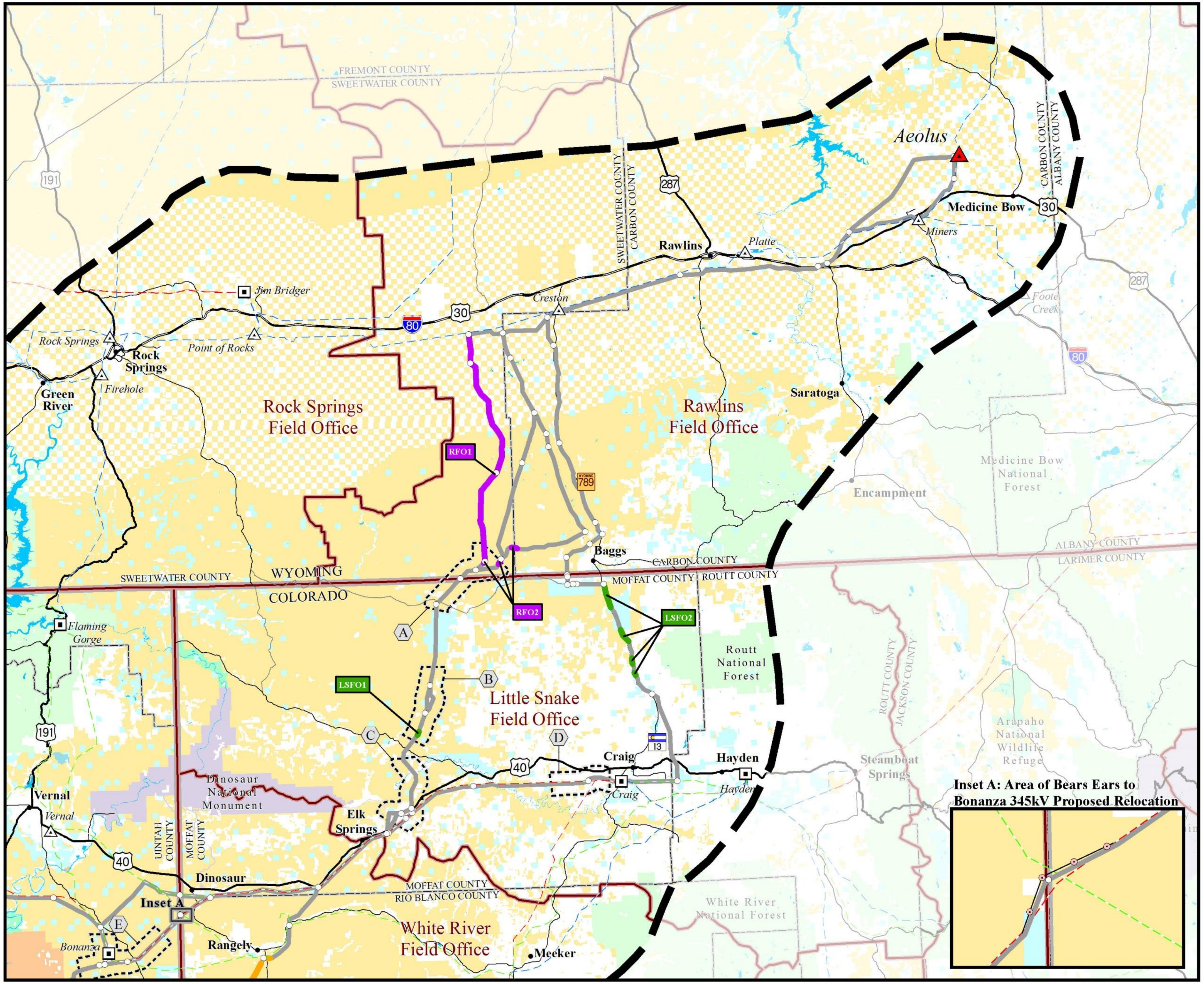
5.1.2 Planning Area Boundaries

Most of the LUPAs needed to bring the Project’s alternative routes into conformance would be limited to the specific portions of the 250-foot right-of-way for the transmission line and the boundaries of ancillary facilities that would not be in conformance with the applicable land-use plan. In this case, the boundaries of the planning area (i.e., the area affected by the LUPA) are limited to the proposed 250-foot right-of-way on lands administered by the relevant BLM field office or national forest. For amendments to change the designation of a utility corridor for underground utilities only to allow both underground and overhead utilities or widen an existing utility, the planning area boundary is the extent of the modified utility corridor.

5.1.3 Planning Issues and Criteria

A list of the issues identified from scoping is presented in Table 1-1. The following general planning criteria were developed for the potential LUPAs to help focus analysis of the impact of amending the various land-use plans.

- Actions must comply with laws, executive orders, regulations, and policy.
- The planning effort recognizes valid existing rights.
- The LUPA will apply only to the BLM- and USFS-administered lands in the planning area boundaries. In the planning area, management decisions will not apply to private or tribal lands, mineral estates, or public lands administered by other federal agencies or the federal mineral estate underlying public lands administered by other federal agencies.
- To the extent possible, and within legal and regulatory parameters, management and LUPA decisions will be consistent with officially approved or adopted resource-related plans, and the policies and programs contained therein, of other federal agencies, state and local governments and Indian tribes, so long as the guidance and resource management plans also are consistent with the purposes, policies, and programs of federal laws and regulations applicable to federal lands, including federal and state pollution control laws as implemented by applicable federal and state air, water, noise, and other pollution standards or implementation plans. The responsible official will not conform management to meet non-Forest Service objectives or policies.
- Planning and management direction will be focused on the relative values of resources and not the combination of uses that will give the greatest economic return or economic output.
- Existing endangered species recovery plans, including plans for reintroduction of endangered species and other species, will be considered. Consultation, coordination, and cooperation with the FWS will be in accordance with interagency MOUs regarding Section 7 Consultation.



Map 5-1a

Potential Plan Amendments Northern Area

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Potential Plan Amendments by Agency[1]

- ▢ Reference Number (Refer to Table 5-1)
- 🟩 Ashley LRMP (ANF)
- 🟩 Grand Junction RMP (GJFO)
- 🟩 Little Snake RMP (LSFO)
- 🟥 Manti-La Sal LRMP (MLSNF)
- 🟫 Moab RMP (MFO)
- 🟪 Pony Express RMP (Salt Lake Field Office [SLFO])
- 🟪 Price RMP (PFO)
- 🟪 Rawlins RMP (RFO)
- 🟨 Uinta LRMP (UNF)
- 🟦 Vernal RMP (VFO)
- 🟧 White River RMP[2] (WRFO)

Project Features

- Project Area Boundary
- ▲ Substation (Project Terminal)
- Alternative Route
- Link Number
- ○ Link Node
- Series Compensation Station Siting Area
- 345kV Proposed Relocation (Inset A)
- 345kV Proposed Rebuild (Segment 4a and 4b - Inset C)
- 345kV Proposed Reroute (Segment 4c - Inset C)

Land Ownership

- 🟨 Bureau of Land Management
- 🟨 Bureau of Reclamation
- 🟧 Indian Reservation
- 🟪 National Park Service
- 🟪 U.S. Department of Defense
- 🟩 U.S. Fish and Wildlife Service
- 🟩 U.S. Forest Service
- 🟦 State Land
- ▢ Private Land

General Reference

- ● City or Town
- △ Substation
- ▣ Power Plant
- 500kV Transmission Line
- 345kV Transmission Line
- 230kV Transmission Line
- 138kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Other Road
- 🟦 Lake or Reservoir
- ▢ State Boundary
- ▢ County Boundary
- ▢ BLM Field Office Boundary
- ▢ U.S. Forest Service Boundary[3]

SOURCES:
Potential Plan Amendments, EPG 2015;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads, and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013; U.S. Forest Service Boundary, USFS 2006;
BLM Field Office Boundary, BLM 2008

NOTES:

[1] LRMP is the U.S. Forest Service Land and Resource Management Plan and RMP is the Bureau of Land Management Resource Management Plan.

[2] The location(s) of potential plan amendment WRFO1 is not displayed; however, the location(s) will be identified during surveys of the selected route.

[3] U.S. Forest Service boundary shown only within Inset B.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
- Substation symbols do not necessarily represent precise locations.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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Miles

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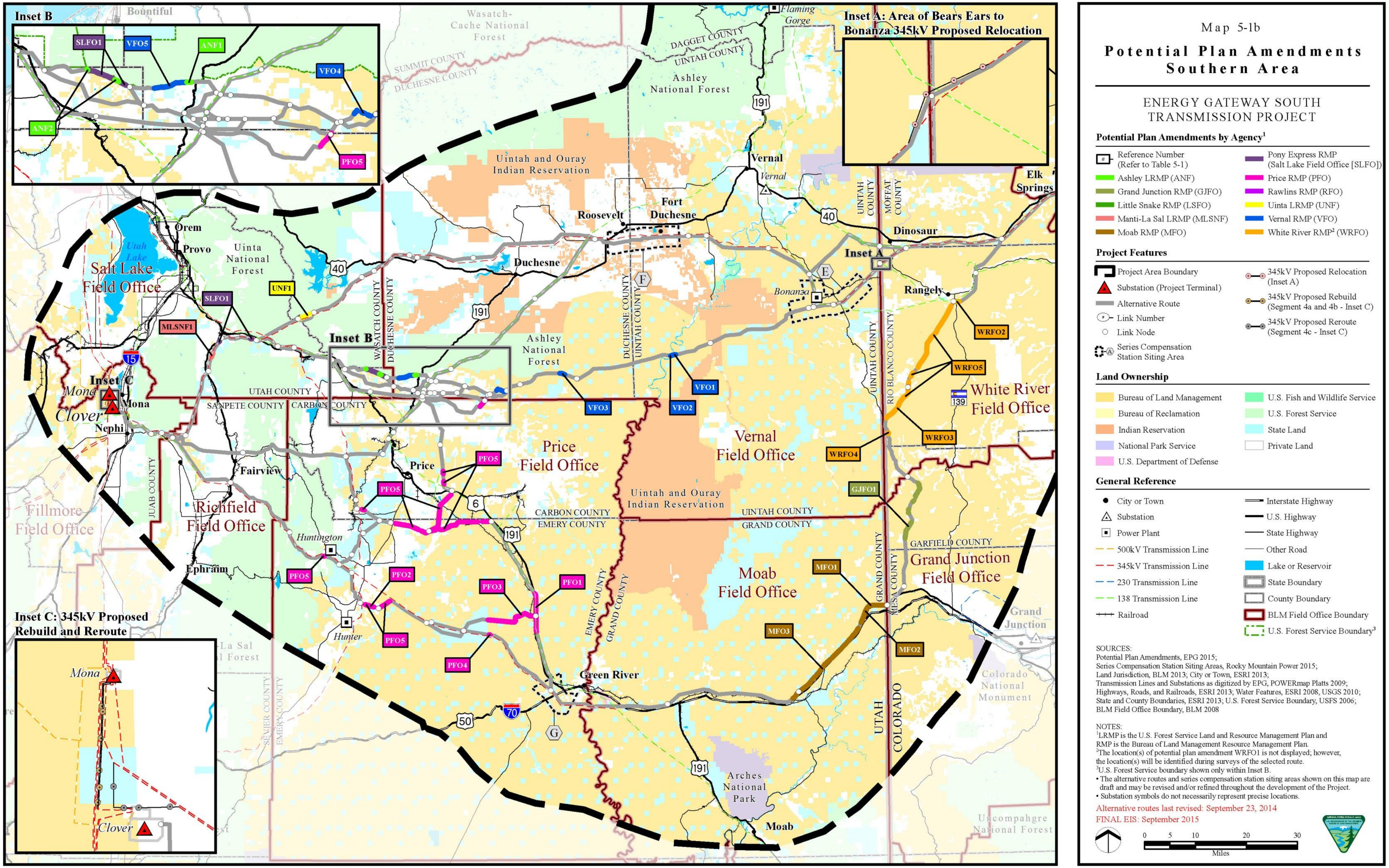
Map 5-1b

Potential Plan Amendments Southern Area

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT



SOURCES:
Potential Plan Amendments, EPG 2015;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads, and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013; U.S. Forest Service Boundary, USFS 2006;
BLM Field Office Boundary, BLM 2008

NOTES:

[1] LRMP is the U.S. Forest Service Land and Resource Management Plan and RMP is the Bureau of Land Management Resource Management Plan.

[2] The location(s) of potential plan amendment WRFO1 is not displayed; however, the location(s) will be identified during surveys of the selected route.

[3] U.S. Forest Service boundary shown only within Inset B.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
- Substation symbols do not necessarily represent precise locations.

Alternative routes last revised: September 23, 2014

FINAL EIS: September 2015

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5.1.4 Potential Land-use Plan Amendments

Table 5-1 lists the resource management plans by state that could require an amendment, the identified nonconformance issue, and the applicable alternative routes relative to the potential LUPAs. Complete descriptions of the potential LUPAs and associated effects are discussed in Tables 5-2 through 5-33.

The types of potential LUPAs needed to address nonconformance include:

- Converting underground utility corridors to allow aboveground utilities
- Modifying VRM classifications (BLM)
- Modifying VQO classifications (USFS)
- Granting a one-time exception to allow a transmission line right-of-way to cross an ACEC if the ACEC can be spanned
- Widening portions of a utility corridor designated in a land-use plan to include the Project right-of-way.

5.1.4.1 Direct and Indirect Effects

Because most of the planning boundaries are limited to the 250-foot right-of-way for the transmission line and the boundaries of ancillary facilities, the direct and indirect effects on the resources and resource uses from amending decisions in the land-use plans to accommodate the Project would be similar to the direct and indirect effects of constructing, operating, and maintaining the Project described in Chapter 3 (and Appendix F). Refer to the following sections for discussion of direct and indirect effects for each resource:

- Climate and Air Quality (Section 3.2.1)
- Earth Resources (Section 3.2.2)
- Paleontological Resources (Section 3.2.3)
- Water Resources (Section 3.2.4)
- Vegetation (Section 3.2.5)
- Special Status Plants (Section 3.2.6)
- Wildlife (Section 3.2.7)
- Special Status Wildlife (Section 3.2.8)
- Migratory Birds (Section 3.2.9)
- Fish and Aquatic Resources (Section 3.2.10)
- Land Use (Section 3.2.11)
- Parks, Preservation, and Recreation (Section 3.2.12)
- Transportation and Access (Section 3.2.13)
- Congressional Designations (Section 3.2.14)
- Special Designations and Other Management Areas (Section 3.2.15)
- Lands with Wilderness Characteristics (Section 3.2.16)
- Inventoried Roadless Areas and Unroaded/Undeveloped Areas (Section 3.2.17)
- Visual Resources (Section 3.2.18)
- National Trails System (Section 3.2.19)
- Cultural Resources (Section 3.2.20)
- Fire Ecology and Management (Section 3.2.21)
- Social and Economic Conditions (Section 3.2.22)
- Public Health and Safety (Section 3.2.23)

The direct and indirect effects of the LUPAs are presented in Tables 5-2 through 5-33.

5.1.4.2 Cumulative Effects

Amended land-use plan direction resulting from amendment of land-use plan decisions to accommodate the Project (i.e., converting underground utility corridors to allow aboveground utilities; modifying visual resource classifications; granting a one-time exception to allow a transmission line right-of-way to cross an ACEC, if the ACEC can be spanned; or widening portions of a utility corridor designated in a land-use plan to include the Project right-of-way) could, cumulatively, affect future decisions regarding management of the adjacent areas along with the effects of other RFFAs (i.e., future linear utilities, especially other overhead transmission lines). The cumulative effects of the proposed LUPAs are presented in Tables 5-2 through 5-33.

TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Wyoming					
Bureau of Land Management Rawlins Field Office					
Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)	Yes	🟪 RFO1	Table 5-2	The alternative route is in the Colorado Interstate Gas/Entegra/Wyoming Interstate Company pipeline corridor, which is designated for underground utilities only.	WYCO-C
	Yes	🟪 RFO2	Table 5-3	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Cherokee Historic Trail in these areas would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Sheet Worksheet, Key Observation Point (KOP) #276.	WYCO-B (Agency and Applicant Preferred Alternative), WYCO-C, and WYCO-F
Colorado					
Bureau of Land Management Little Snake Field Office					
Little Snake Record of Decision and Approved Resource Management Plan (BLM 2011b)	Yes	🟩 LSFO1	Table 5-4	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Godiva Rim Proposed Backcountry Byway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #289.	WYCO-B (Agency and Applicant Preferred Alternative), WYCO-C, and WYCO-F
	Yes	🟩 LSFO2	Table 5-5	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Colorado State Highway 13 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #66, and associated visual simulation.	WYCO-D

TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Bureau of Land Management White River Field Office					
White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (BLM 2015b)	Yes	🟧 WRFO1	Table 5-6	All suitable habitat for listed and candidate plant species are exclusion areas for new rights-of-way authorizations.	Unknown
	Yes	🟧 WRFO2	Table 5-7	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Dinosaur Diamond Scenic Byway in Canyon Pintado would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #241, and associated visual simulation.	All COUT BAX
	Yes	🟧 WRFO3	Table 5-8	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Baxter Pass Road would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #244, and associated visual simulation.	All COUT BAX
	Yes	🟧 WRFO4	Table 5-9	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, visual effects resulting from the proximity of the Project to a residence in Whiskey Creek would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #242.	All COUT BAX
	Yes	🟧 WRFO5	Table 5-10	The alternative routes follow the Dragon Trail-Atchee Ridge utility corridor, which is designated for underground utilities only.	All COUT BAX
Bureau of Land Management Grand Junction Field Office					
Grand Junction Resource Area Record of Decision and Approved Resource Management Plan, 2015 (BLM 2015a)	Yes	🟩 GJFO1	Table 5-11	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Garfield County Road 201 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #244, and associated visual simulation.	All COUT BAX

TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Colorado Canyons National Conservation Area					
Colorado Canyons (McInnis Canyons) National Conservation Area Resource Management Plan (BLM 2004c)	No	Not applicable	Table 5-12	None	Not applicable
National Park Service					
National Park Service Dinosaur National Monument: Dinosaur National Monument General Management Plan (NPS 1986)	No	Not applicable	Table 5-13	None	Not applicable
Utah					
Bureau of Land Management Salt Lake City Field Office					
Salt Lake District, Record of Decision for the Pony Express Resource Management Plan and Rangeland Program Summary for Utah County (BLM 1990)	Yes	🟪 SLFO1	Table 5-14	The alternative routes traverse small parcels of lands administered by the Salt Lake Field Office not located in a designated utility corridor. According to the Pony Express RMP Record of Decision (page 56) "future proposals for major rights-of-way such as pipelines, large power lines, and permanent improved roads must use identified corridors. Otherwise, a planning amendment and appropriate environmental analysis will be required. Proposals that are not considered major may be sited outside corridors after demonstrating that locating in a corridor is not viable. In all cases, the utilization of ROW [right-of-way] in common shall be considered whenever possible."	COUT-A, COUT-B, COUT-C (Agency and Applicant Preferred Alternative), Timberlane/Argyle Canyon Variations 2 and 5[1]
Bureau of Land Management Fillmore Field Office					
Richfield District House Range Resource Management Plan and Record of Decision Rangeland Program Summary (BLM 1987)	No	Not applicable	Table 5-15	None	Not applicable

TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Bureau of Land Management Price Field Office					
Price Field Office Record of Decision and Approved Resource Management Plan (BLM 2008d)	Yes	🟪 PFO1	Table 5-16	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Dinosaur Diamond Scenic Byway (U.S. Highway 6) would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #41, and associated visual simulation.	COUT BAX-C, COUT BAX-E
Price Field Office Record of Decision and Approved Resource Management Plan (BLM 2008d)	Yes	🟪 PFO2	Table 5-17	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Wedge Overlook/Buckhorn Draw Scenic Backway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #218.	COUT BAX-B, COUT BAX-C
	Yes	🟪 PFO3	Table 5-18	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the San Rafael Swell Destination Route (Green River Cutoff Road) would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #326.	COUT BAX-C
	Yes	🟪 PFO4	Table 5-19	Crosses Big Hole Rock Art Area of Critical Environmental Concern, an exclusion area for new utility corridors.	COUT BAX-B
Price Field Office Record of Decision and Approved Resource Management Plan (BLM 2008d)	Yes	🟪 PFO5	Table 5-20	New utility corridors in these areas will require a potential land-use plan amendment.	All COUT BAX, COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I, Camp Timberlane/ Argyle Canyon Variations 1 and 2[1]

TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Bureau of Land Management Vernal Field Office					
Vernal Field Office Record of Decision and Approved Resource Management Plan (BLM 2008f)	Yes	🟦 VFO1	Table 5-21	New utilities must cross the Green River at Fourmile Bottom. The alternative routes cross in the designated area, which also is designated as VRM Class II. Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Green River at Fourmile Bottom would not be compliant with VRM Class II objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #203, and associated visual simulation.	COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I
	Yes	🟦 VFO2	Table 5-22	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Enron Recreation Area would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Worksheet, KOP #87, and associated visual simulation.	COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I
	Yes	🟦 VFO3	Table 5-23	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Nine Mile Canyon Scenic Backway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #273.	COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I
Vernal Field Office Record of Decision and Approved Resource Management Plan (BLM 2008f)	Yes	🟦 VFO4	Table 5-24	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Argyle Canyon Road would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheets, KOP #200, and associated visual simulation.	COUT-H, COUT-I, Argyle Ridge Variation 1[1]

TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
	Yes	🟦 VFO5	Table 5-25	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Reservation Ridge Scenic Backway would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #329.	Camp Timberlane/ Argyle Canyon Variation 5[1]
Bureau of Land Management Richfield Field Office					
Richfield Field Office, Record of Decision and Approved Resource Management Plan (BLM 2008e)	No	Not applicable	Table 5-26	Not applicable	Not applicable
Bureau of Land Management Moab Field Office					
Moab Field Office Record of Decision and Approved Resource Management Plan (BLM 2008c)	Yes	🟫 MFO1	Table 5-27	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Old U.S. Highway 6 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #245.	All COUT BAX
	Yes	🟫 MFO2	Table 5-28	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Harley Dome Rest Area (along Interstate 70 [I-70]) would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #152, and associated visual simulation.	All COUT BAX
Moab Field Office Record of Decision and Approved Resource Management Plan (BLM 2008c)	Yes	🟫 MFO3	Table 5-29	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling I-70 would not be compliant with VRM Class III objectives established in the RMP for the area. Refer to Appendix M – Contrast Rating Worksheet, KOP #246.	All COUT BAX

TABLE 5-1
POTENTIAL LAND-USE PLAN AMENDMENTS

Resource Management Plan	Could Decision Require Amendment?	Identification Number on Maps 5-1a and 5-1b	Refer to Table Number	Nonconformance Issue (s)	Alternative Routes Relevant to Potential Plan Amendment
Manti-La Sal national Forest					
Manti-La Sal National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986b)	Yes	🟥 MLSNF1	Table 5-30	Per a standard for the General Big-game Winter Range Management Unit (management emphasis is on general big-game winter range) in the 1986 Manti-La Sal National Forest Land and Resource Management Plan (LRMP) states that activities must meet the Visual Quality Objective (VQO) except where habitat improvement activities occur. Due to the proximity of the Project to U.S. Highway 89 and residences in the Birdseye, Utah, area, the Project would not be subordinate to the characteristic landscape in these areas, which would be inconsistent with the definition of a partial retention VQO.[2]	COUT-A, COUT-B, COUT-C (Agency and Applicant Preferred Alternative)
Ashley National Forest					
Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (USFS 1986a)	Yes	🟩 ANF1	Table 5-31	A forest-wide standard in the 1986 Ashley National Forest LRMP states that the forest will manage visual resource according to the adopted VQO. Due to proximity to the Avintaquin Campground and paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with a retention VQO.[2]	Camp Timberlane/ Argyle Canyon Variation 5
Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (USFS 1986a)	Yes	🟩 ANF2	Table 5-32	A forest-wide standard in the 1986 Ashley National Forest LRMP states that the forest will manage visual resource according to the adopted VQO. Due to paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with a partial retention VQO.[2]	Camp Timberlane/ Argyle Canyon Variations 2 and 5[1]
Uinta-Wasatch-Cache National Forests					
Uinta National Forest, Record of Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (USFS 2003)	Yes	🟨 UNF1	Table 5-33	Due to being outside of the Uinta National Forest utility corridor where it crosses the inventoried roadless area, the Project would not be consistent with the Uinta National Forest LRMP.[2]	Chipman Creek Variation 1[1]

NOTES:

[1] The Camp Timberlane/Argyle Canyon and Argyle Ridge route variations are local routing options considered for Alternative COUT-C, the Agency and Applicant Preferred Alternative. Chipman Creek Variation 1 is a local routing option of Alternative COUT-A on the Uinta-Wasatch-Cache National Forest. Detailed mapping of these route variations is presented in Appendix F.

[2] Additional information on the specific management areas crossed, and their management emphasis, is included in Appendix D.

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TABLE 5-2
BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO1

Identification Number on Map 5-1a	🟪 RFO1	
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management 2008b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	The alternative route is in the Colorado Interstate Gas/Entegra/Wyoming Interstate Company pipeline corridor, which is designated for underground utilities only.	
Description of Potential Plan Amendment	Right-of-way decisions listed under Section 2.3.5 (Lands and Realty) in the approved resource management plan (page 2-18) would be amended as follows ***(new text in bold italics)***: Utility/Transportation Systems 1. Areas with important resource values will be avoided where possible in planning for new facility placement (600,290 acres). If it becomes necessary for facilities (i.e., linear rights-of-way) to be placed within avoidance areas, effects will be intensively managed. Avoidance and exclusion areas are identified on Map 2-33b and Table 2-5. ***2. CIG [Colorado Interstate Gas]/Entrega/WIC [Wyoming Interstate Company] utility corridor: Conversion of the existing north-south underground corridor to include aboveground utilities is designated west of the Sweetwater/Carbon County line. Exceptions to resource stipulations in the designated corridor may be granted if measures of avoidance or minimization are not feasible. All possible measures will be taken to avoid conflicts with other existing and proposed uses (utility and otherwise) in the designated corridor.***	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	WYCO-C	Links W128 5.1 miles W27 20.5 miles W409 16.5 miles

Potential Environmental Effects

Direct and Indirect Effects
The direct and indirect effects on the resources attributed to amending the designation of the underground pipeline corridor to allow overhead utilities, such as the Project, would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternative WYCO-C in Chapter 3 since this amendment would allow the Project to be permitted along this route.

Cumulative Effects
By amending the land-use plan to convert the existing north-south underground corridor to allow aboveground utilities, overhead and additional underground utilities would be accommodated in the corridor. If overhead utilities are developed, such as the Project, the TransWest Express Project, or other future extra-high-voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4.

TABLE 5-2
BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO1

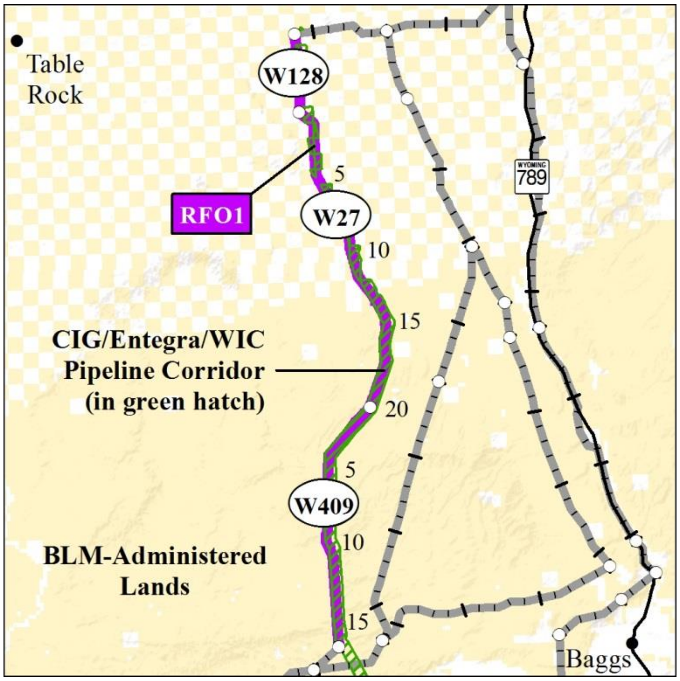
Identification Number on Map 5-1a	🟪 RFO1
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management 2008b)
Conversion of the existing north-south underground corridor to allow aboveground utilities could require existing and future pipelines to install cathodic protection if it is currently not in place. Currently, the pipelines located in the underground corridor have modified existing vegetation forms through the development of a geometrically cleared right-of-way. By amending the right-of-way decision to allow overhead utilities, transmission structures could be constructed with associated geometric right-of-way vegetation clearing and construction access roads for future transmission projects, which would further modify the landscape character and views in this area.	

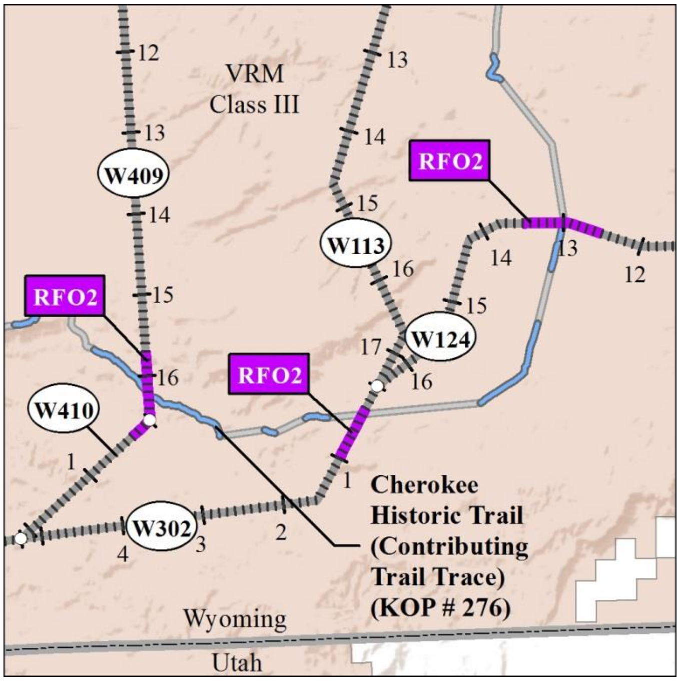
TABLE 5-3
BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO2

Identification Number on Map 5-1a	🟪 RFO2
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)
Could Decision Require Amendment?	Yes
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Cherokee Historic Trail in these areas would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Sheet Worksheet, Key Observation Point #276.
Description of Potential Plan Amendment	The Rawlins RMP currently states the relevant goal, management objectives, and management actions for visual resource management (page 2-48). Goal – Manage public lands according to VRM classes that are determined based on land use allocation decisions made in this RMP. Management Objectives: • Establish VRM Classes for the RMPPA. • Maintain the overall integrity of visual resource classes while allowing for development of existing and future uses Management Actions • Manage visual resources to meet the Wyoming Standards for Healthy Rangelands. • VRM classes are designated as shown on Map 2-50 (Table 2-9 and Appendix 25). The following text will be added to amend the second management action (***new text in bold italics***; note: each amendment is associated with a specific transmission line alternative route): WYCO-B (Agency and Applicant Preferred Alternative) ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link W302 from Milepost 0.3 to 1.0 (approximately 0.7 mile) would be amended to VRM Class IV (a total of 21 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** WYCO-C ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link W409 from Milepost 15.7 to 16.6 and Link W410 from Milepost 0.0 to 0.3 of the Project (approximately 1.2 miles) would be amended to VRM Class IV (a total of 36 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.***

TABLE 5-3
BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO2

Identification Number on Map 5-1a	🟪 RFO2	
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)	
Description of Potential Plan Amendment	WYCO-F ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link W124 from Milepost 12.5 to 13.5 and Link W302 from Milepost 0.3 to 1.0 of the Project (approximately 1.7 miles) would be amended to VRM Class IV (a total of 51 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Rawlins RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	WYCO-B (Agency and Applicant Preferred Alternative)	Links W302 0.7 mile
	WYCO-C	Links W409 0.9 mile W410 0.3 mile
	WYCO-F	Links W124 1.0 mile W302 0.7 mile

Potential Environmental Effects



The following components of the Rawlins Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

WYCO-B (Agency and Applicant Preferred Alternative)
Scenic Quality Rating Units: 21 acres of Class B lands
Sensitivity Level Rating Units: 21 acres of high sensitivity lands
Distance Zones: 21 acres in the foreground-middleground distance zone
VRI Class: 21 acres of VRI Class II lands

WYCO-C
Scenic Quality Rating Units: 36 acres of Class B lands
Sensitivity Level Rating Units: 36 acres of high sensitivity lands
Distance Zones: 36 acres in the foreground-middleground distance zone
VRI Class: 36 acres of VRI Class II lands

WYCO-F
Scenic Quality Rating Units: 21 acres of Class B and 30 acres of Class C lands
Sensitivity Level Rating Units: 21 acres of high sensitivity and 30 acres of moderate sensitivity lands
Distance Zones: 51 acres in the foreground-middleground distance zone
VRI Class: 21 acres of VRI Class II and 30 acres of VRI Class IV lands

TABLE 5-3
BUREAU OF LAND MANAGEMENT RAWLINS FIELD OFFICE PLAN AMENDMENT RFO2

Identification Number on Map 5-1a	🟪 RFO2
Resource Management Plan	Record of Decision and Approved Rawlins Resource Management Plan (Bureau of Land Management [BLM] 2008b)

Amendment of the land-use plan would result in the following changes to the overall Rawlins Field Office VRM objectives:

WYCO-B(Agency and Applicant Preferred Alternative): 21 fewer acres of VRM Class III (currently 2,336,836 acres) and 21 more acres of VRM Class IV (currently 828,014 acres)
WYCO-C: 36 fewer acres of VRM Class III (currently 2,336,836 acres) and 36 more acres of VRM Class IV (currently 828,014 acres)
WYCO-F: 51 fewer acres of VRM Class III (currently 2,336,836 acres) and 51 more acres of VRM Class IV (currently 828,014 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 21, 36, or 51 acres (depending on the selected alternative route) adjacent to the Cherokee Historic Trail were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

Cumulative Effects
As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Rawlins RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

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TABLE 5-4
BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO1

<table>
<tr><td>Identification Number on Map 5-1a</td><td colspan="2">🟩 LSFO1</td></tr>
<tr><td>Resource Management Plan</td><td colspan="2">Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)</td></tr>
<tr><td>Could Decision Require Amendment?</td><td colspan="2">Yes</td></tr>
<tr><td>Nonconformance Issue</td><td colspan="2">Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Godiva Rim Proposed Backcountry Byway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #289.</td></tr>
<tr><td>Description of Potential Plan Amendment</td><td colspan="2">The BLM Little Snake RMP currently states the relevant goal and objectives for visual resource management (RMP-34).
Goal - Recognize and manage visual resources for overall multiple use and quality of life for local communities and visitors to public lands.
Objectives for achieving these goals include:
• Maintain visual characteristics/values as designated by management classes.
• Ensure land management projects and uses meet VRM objectives within the boundaries of the designated VRM management class.
Additionally, management actions list the areas by VRM Class to be managed according to those objectives. The following text will be added to amend the list of Class IV locations (<i>new text in bold italics</i>):
<i>The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link C91 from Milepost 3.4 to 4.0 of the Project (approximately 0.6 mile) would be amended to VRM Class IV (a total of 18 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.</i>
Amendment of this decision in the Little Snake RMP would facilitate accommodation of the Project with revised plan VRM objectives.</td></tr>
<tr><td>Alternative Routes (Link[s]) Relevant to Potential Plan Amendment</td><td>WYCO-B (Agency and Applicant Preferred Alternative), WYCO-C, WYCO-F</td><td><u>Link</u>
C91 0.6 mile</td></tr>
</table>

TABLE 5-4
BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO1

Identification Number on Map 5-1a	🟩 LSFO1
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)

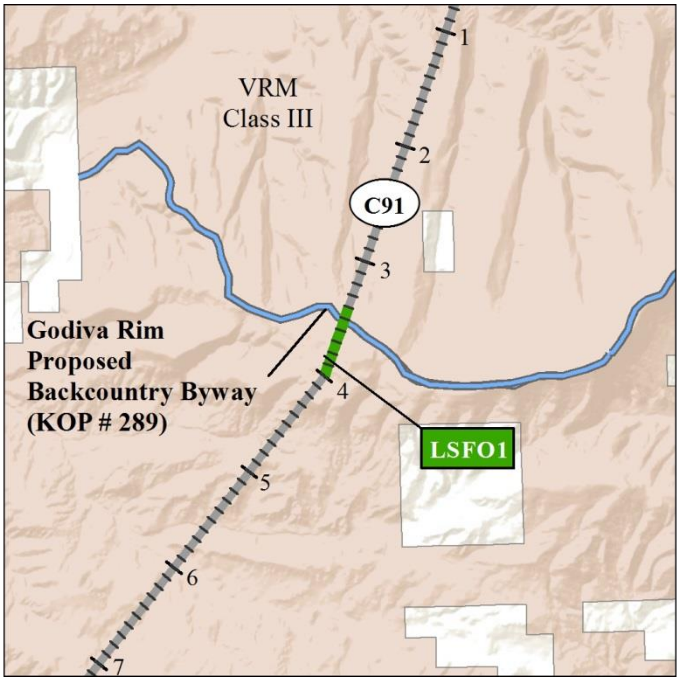
Potential Environmental Effects

The following components of the Little Snake Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 18 acres of Class B lands
Sensitivity Level Rating Units: 18 acres of high sensitivity lands
Distance Zones: 18 acres in the foreground-middleground distance zone
VRI Class: 18 acres of VRI Class II lands

Amendment of the land-use plan would result in the following changes to the overall Little Snake Field Office VRM objectives:

WYCO-B (Agency and Applicant Preferred Alternative): 8 fewer acres of VRM Class III (currently 929,270 acres) and 18 more acres of VRM Class IV (currently 178,590 acres)
WYCO-C: 18 fewer acres of VRM Class III (currently 929,270 acres) and 18 more acres of VRM Class IV (currently 178,590 acres)
WYCO-F: 18 fewer acres of VRM Class III (currently 929,270 acres) and 18 more acres of VRM Class IV (currently 178,590 acres)



Direct and Indirect Effects

This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 18 acres adjacent to the Godiva Rim Proposed Backcountry Byway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: "The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements."

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-4
BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO1

Identification Number on Map 5-1a	🟩 LSFO1
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)

Cumulative Effects

As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Little Snake RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

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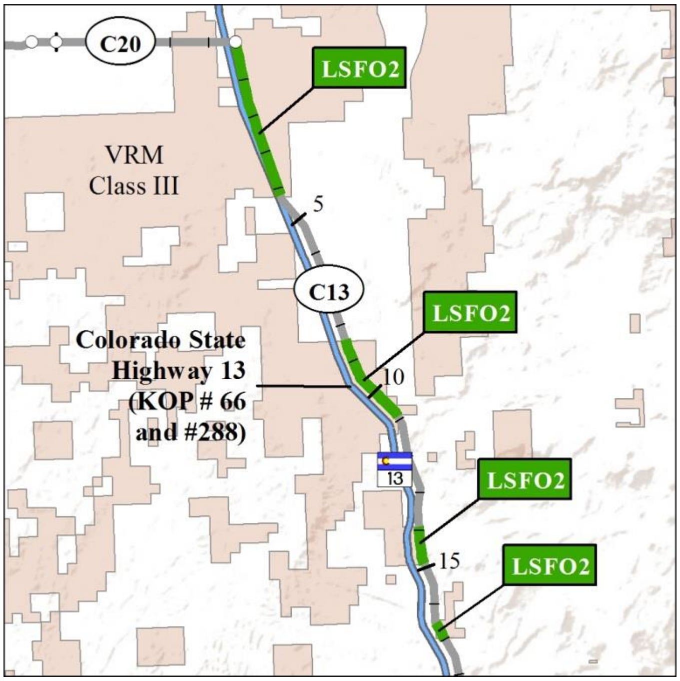
TABLE 5-5
BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO2

Identification Number on Map 5-1a	🟩 LSFO2	
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Colorado State Highway 13 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #66 and #288, and associated visual simulation.	
Description of Potential Plan Amendment	The BLM Little Snake RMP currently states the relevant goal and objectives for visual resource management (RMP-34) . Goal - Recognize and manage visual resources for overall multiple use and quality of life for local communities and visitors to public lands. Objectives for achieving these goals include: • Maintain visual characteristics/values as designated by management classes. • Ensure land management projects and uses meet VRM objectives within the boundaries of the designated VRM management class. Additionally, management actions list areas by VRM Class to be managed according to those objectives. The following text will be added to amend the list of Class IV locations (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link C13 from Mileposts 0.0 to 4.2, 8.4 to 10.9, 13.9 to 14.9, and 16.5 to 17.0 of the Project (approximately 8.2 miles) would be amended to VRM Class IV (a total of 246 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Little Snake RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	WYCO-D	Link C13 8.2 miles

TABLE 5-5
BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO2

Identification Number on Map 5-1a	🟩 LSFO2
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)

Potential Environmental Effects



The following components of the Little Snake Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 44 acres of Class B and 202 acres of Class C lands
Sensitivity Level Rating Units: 59 acres of moderate and 187 acres of low sensitivity lands
Distance Zones: 246 acres in the foreground-middleground distance zone
VRI Class: 44 acres of VRI Class III and 202 acres of VRI Class IV lands.

Amendment of the land-use plan would result in the following changes to the overall Little Snake Field Office VRM objectives:

WYCO-D: 246 fewer acres of VRM Class III (currently 929,270 acres) and 246 more acres of VRM Class IV (currently 178,590 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 246 acres adjacent to Colorado State Highway 13 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: "The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements."

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-5 BUREAU OF LAND MANAGEMENT LITTLE SNAKE FIELD OFFICE PLAN AMENDMENT LSFO2	
Identification Number on Map 5-1a	🟩 LSFO2
Resource Management Plan	Little Snake Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2011b)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Little Snake RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

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TABLE 5-6
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO1

Identification Number on Map 5-1b	🟧 WRFO1	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	All suitable habitat for listed and candidate plant species are exclusion areas for new rights-of-way authorizations. Potential habitat for Ute ladies'-tresses (threatened) occurs throughout the White River Field Office. Field surveys would be required to determine the precise locations of suitable habitat for this species.	
Description of Potential Plan Amendment	Decisions regarding right-of-way exclusion areas for listed plant species in Chapter 2 (Resource Decisions) of the Approved Resource Management Plan (page 2-17) would be amended as follows (***new text in bold italics***): All known and potential [suitable] for listed and candidate plant species, including Areas of Critical Environmental Concern, are exclusion areas for new rights-of-way authorizations.” ***Portions of the Energy Gateway South Transmission Project may overlap with habitat for listed plant species. If, after application of all feasible mitigation measures to reduce impacts on special status plant habitat (including spanning habitats and approving narrower rights-of-way), the Project would still occur in identified habitat, an exception could be granted by the Field Manager in those areas if it was determined, in consultation with the U.S. Fish and Wildlife Service, that the construction, operation, and maintenance of the Energy Gateway South Transmission Project would not preclude the survival and recovery of the species. The Raven Ridge Area of Critical Environmental Concern would remain an exclusion area and the Energy Gateway South Transmission Project would not be permitted in this area.***	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All alternatives in White River Field Office	Unknown

TABLE 5-6
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO1

Identification Number on Map 5-1b	🟧 WRFO1
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)
Potential Environmental Effects	
Surveys for all special status species would be conducted along the selected alternative route prior to construction activities. Potential [suitable] habitat for listed and candidate plant species or populations identified in the White River Field Office would be avoided to the extent possible and any additional mitigation measures would be incorporated into the Plan of Development. The effects of the plan amendment would be the same as the effects of constructing the transmission line.	Map insert cannot be provided as locations where suitable habitat for listed and candidate plants could occur would be determined during surveys along the selected alternative route.

TABLE 5-7
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO2

Identification Number on Map 5-1b	🟧 WRFO2	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Dinosaur Diamond Scenic Byway in Canyon Pintado would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #241, and associated visual simulation.	
Description of Potential Plan Amendment	Chapter 2 (Resource Decisions) of the BLM White River approved RMP (page 2-39) currently states the decisions regarding consistency with VRM classification objectives. Proposed management action and projects will be evaluated for consistency with VRM classification objectives. Management actions and projects that would noticeably change the characteristic of the more sensitive landscapes would be modified to blend in with the landscape, denied, or moved to another more suitable location. The following text will be added to amend the RMP (***new text in bold italics)***: ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link C185 from Milepost 7.2 to 8.3 of the Project (approximately 1.1 miles) would be amended to VRM Class IV (a total of 34 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the BLM White River RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link C185 1.1 mile

TABLE 5-7
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO2

Identification Number on Map 5-1b	🟧 WRFO2
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)

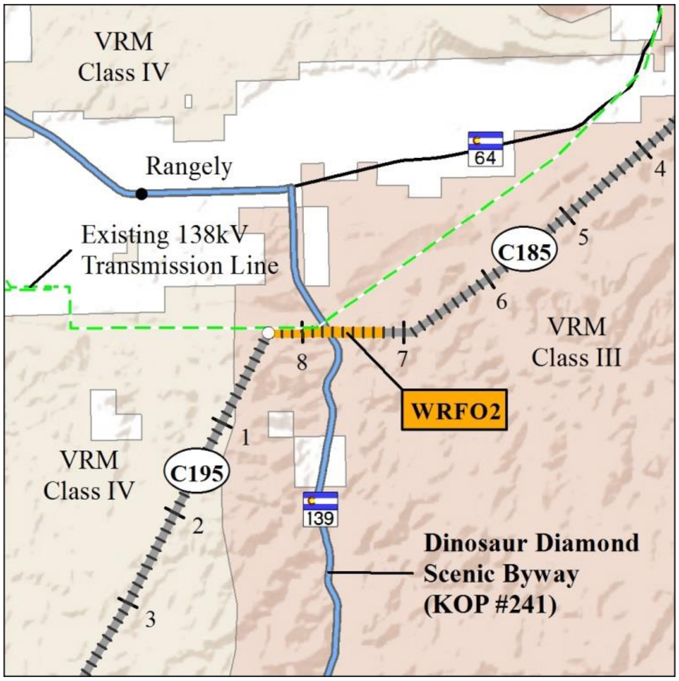
Potential Environmental Effects

The following components of the White River Field Office Visual Resource Inventory (VRI) are located in the planning area boundary :

Scenic Quality Rating Units: 34 acres of Class B lands
Sensitivity Level Rating Units: 34 acres of high sensitivity lands
Distance Zones: 34 acres in the foreground-middleground distance zone
VRI Class: 34 acres of VRI Class II lands

Amendment of the land-use plan would result in the following changes to the overall White River Field Office VRM objectives:

COUT BAX-B: 34 less acres of VRM Class III (currently 861,680 acres) and 34 more acres of VRM Class IV (currently 146,100 acres)
COUT BAX-C: 34 less acres of VRM Class III (currently 861,680 acres) and 34 more acres of VRM Class IV (currently 146,100 acres)
COUT BAX-E: 34 less acres of VRM Class III (currently 861,680 acres) and 34 more acres of VRM Class IV (currently 146,100 acres)



Direct and Indirect Effects

This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 34 acres adjacent to the Dinosaur Diamond Scenic Byway (Colorado State Highway 139) were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-7 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO2	
Identification Number on Map 5-1b	🟧 WRFO2
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the White River RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

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TABLE 5-8
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO3

Identification Number on Map 5-1b	🟧 WRFO3	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Baxter Pass Road would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #244, and associated visual simulation.	
Description of Potential Plan Amendment	Chapter 2 (Resource Decisions) of the White River Approved RMP (page 2-39) currently states the decisions regarding consistency with VRM classification objectives. Proposed management action and projects will be evaluated for consistency with VRM classification objectives. Management actions and projects that would noticeably change the characteristic of the more sensitive landscapes would be modified to blend in with the landscape, denied, or moved to another more suitable location. The following text will be added to amend the RMP (***new text in bold italics)***: ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link C196 from Mileposts 1.2 to 1.4 and 2.0 to 6.4 of the Project (approximately 4.6 miles) would be amended to VRM Class IV (a total of 142 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the White River RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link C196 4.6 miles

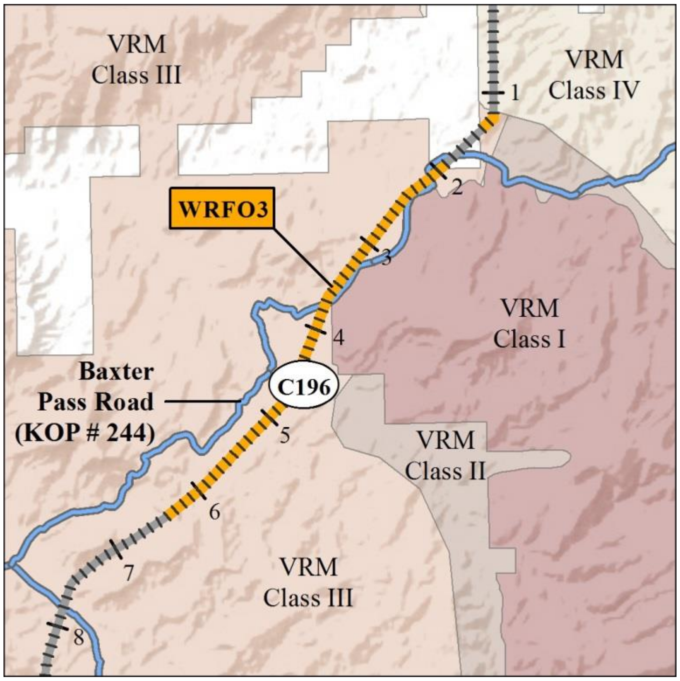
TABLE 5-8
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO3

Identification Number on Map 5-1b	🟧 WRFO3
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)

Potential Environmental Effects

The following components of the White River Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 142 acres of Class B lands
Sensitivity Level Rating Units: 142 acres of high sensitivity lands
Distance Zones: 129 acres in the background and 13 acres in the seldom seen distance zones
VRI Class: 142 acres of VRI Class III lands



Amendment of the land-use plan would result in the following changes to the overall White River Field Office VRM objectives:

COUT BAX-B: 142 less acres of VRM Class III (currently 861,680 acres) and 142 more acres of VRM Class IV (currently 146,100 acres)
COUT BAX-C: 142 less acres of VRM Class III (currently 861,680 acres) and 142 more acres of VRM Class IV (currently 146,100 acres)
COUT BAX-E: 142 less acres of VRM Class III (currently 861,680 acres) and 142 more acres of VRM Class IV (currently 146,100 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 142 acres adjacent to Baxter Pass Road were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: "The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements."

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-8 BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO3	
Identification Number on Map 5-1b	🟧 WRFO3
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the White River RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

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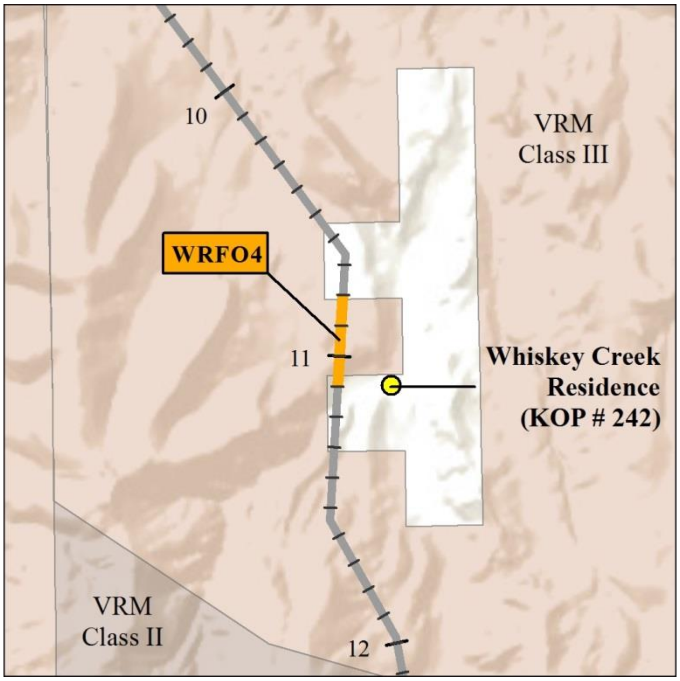
<table>
<tr><th colspan="3">TABLE 5-9
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO4</th></tr>
<tr><td>Identification Number on Map 5-1b</td><td colspan="2">🟧 WRFO4</td></tr>
<tr><td>Resource Management Plan</td><td colspan="2">White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)</td></tr>
<tr><td>Could Decision Require Amendment?</td><td colspan="2">Yes</td></tr>
<tr><td>Nonconformance Issue</td><td colspan="2">Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, visual effects resulting from the proximity of the Project to a residence in Whiskey Creek would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #242.</td></tr>
<tr><td>Description of Potential Plan Amendment</td><td colspan="2">Chapter 2 (Resource Decisions) of the White River Approved RMP (page 2-39) currently states the decisions regarding consistency with VRM classification objectives.
Proposed management action and projects will be evaluated for consistency with VRM classification objectives. Management actions and projects that would noticeably change the characteristic of the more sensitive landscapes would be modified to blend in with the landscape, denied, or moved to another more suitable location.
The following text will be added to amend the RMP (<i>new text in bold italics)</i>:
<i>The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link C196 from Milepost 10.8 to 11.1 of the Project (approximately 0.3 mile) would be amended to VRM Class IV (a total of 8 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.</i>
Amendment of this decision in the White River RMP would facilitate accommodation of the Project with revised plan VRM objectives.</td></tr>
<tr><td>Alternative Routes (Link[s]) Relevant to Potential Plan Amendment</td><td>All COUT BAX alternative routes</td><td>Link
C196 0.3 mile</td></tr>
<tr><th colspan="3">Potential Environmental Effects</th></tr>
<tr><td colspan="3">The following components of the White River Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:
Scenic Quality Rating Units: 8 acres of Class B lands
Sensitivity Level Rating Units: 8 acres of moderate sensitivity lands
Distance Zones: 8 acres in the seldom seen distance zone
VRI Class: 8 acres of VRI Class IV lands
Amendment of the land-use plan would result in the following changes to the overall White River Field Office VRM objectives:
COUT BAX-B: 8 less acres of VRM Class III (currently 861,680 acres) and 8 more acres of VRM Class IV (currently 146,100 acres)
COUT BAX-C: 8 less acres of VRM Class III (currently 861,680 acres) and 8 more acres of VRM Class IV (currently 146,100 acres)</td></tr>
</table>

TABLE 5-9
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO4

Identification Number on Map 5-1b	🟧 WRFO4
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015b)

COUT BAX-E: 8 less acres of VRM Class III (currently 861,680 acres) and 8 more acres of VRM Class IV (currently 146,100 acres)



Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 8 acres adjacent to a residence in Whiskey Creek were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: "The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements."

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

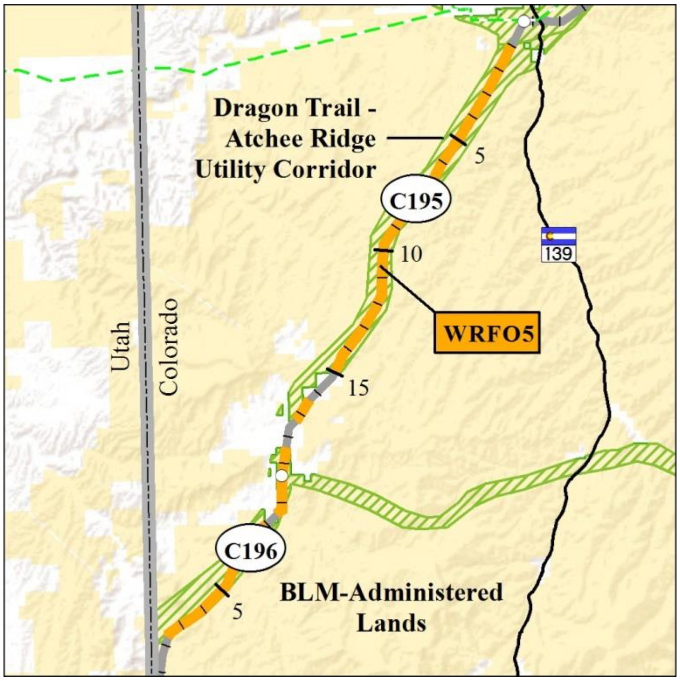
Cumulative Effects
As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the White River RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

TABLE 5-10
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO5

Identification Number on Map 5-1b	🟧 WRFO5	
Resource Management Plan	White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015a)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	The alternative routes follow the Dragon Trail-Atchee Ridge utility corridor, which is designated for underground utilities only.	
Description of Potential Plan Amendment	Right-of-way decisions listed in decisions in the BLM White River Resource Management Plan (page 2-51) would be amended as follows ***(new text in bold italics)***: DRAGON TRAIL-ATCHEE RIDGE: This corridor follows the route once proposed as the Rangely Loop segment of the Northwest Pipeline Expansion Project. It runs south from Rangely, to the vicinity of Baxter Pass, is approximately 1-mile wide, and will accommodate all buried ***and overhead*** linear facilities**.**	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Links C195 16.0 miles C196 7.7 miles

Potential Environmental Effects



Direct and Indirect Effects

The direct and indirect effects on the resources attributed to amending the designation of the pipeline corridor to allow overhead utilities, such as the Project, would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternatives COUT BAX-B, COUT BAX-C, and COUT BAX-E in Chapter 3 since this amendment would allow the Project to be permitted on this route.

Cumulative Effects

By amending the land-use plan to convert the existing underground corridor to allow aboveground utilities, overhead and additional underground utilities could be accommodated in the corridor. If overhead utilities are developed, such as the Project, the TransWest Express Project, or other future extra-high-voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4.

Conversion of the existing north-south underground corridor to allow aboveground utilities could require existing and future pipelines to install cathodic protection if it is currently not in place.

<table>
<tr><th colspan="2">TABLE 5-10
BUREAU OF LAND MANAGEMENT WHITE RIVER FIELD OFFICE PLAN AMENDMENT WRFO5</th></tr>
<tr><td>Identification Number on Map 5-1b</td><td>🟧 WRFO5</td></tr>
<tr><td>Resource Management Plan</td><td>White River Field Office Record of Decision and Approved Resource Management Plan, 2015, as amended (Bureau of Land Management 2015a)</td></tr>
<tr><td colspan="2">Currently, the pipelines located in the underground corridor have modified existing vegetation forms through the development of a geometrically, cleared right-of-way. By amending the right-of-way decision to allow overhead utilities, transmission structures could be constructed, with associated geometric right-of-way vegetation clearing and construction access roads for future transmission projects, which would further modify the landscape character and views in this area.</td></tr>
</table>

TABLE 5-11
BUREAU OF LAND MANAGEMENT GRAND JUNCTION FIELD OFFICE
PLAN AMENDMENT GJFO1

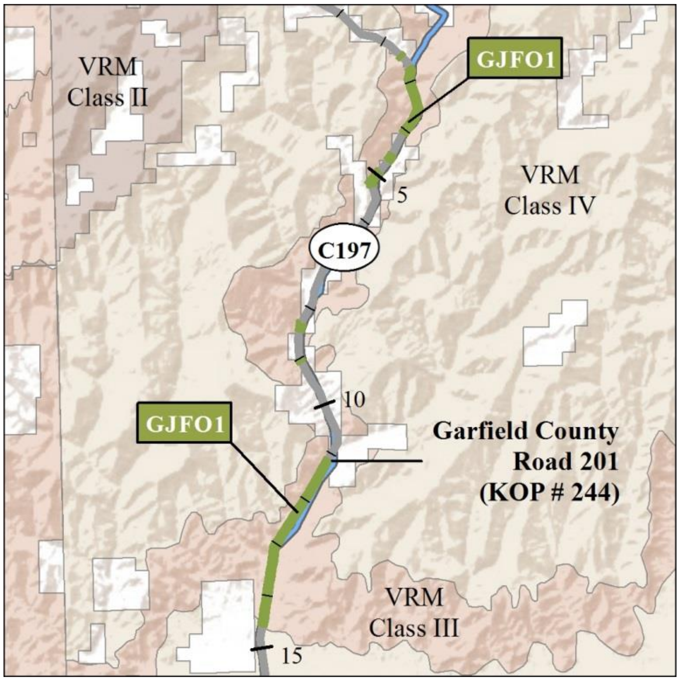
Identification Number on Map 5-1b	🟩 GJFO1	
Resource Management Plan	Grand Junction Field Office Record of Decision and Approved Resource Resource Management Plan, 2015 (Bureau of Land Management [BLM] 2015a)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Garfield County Road 201 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #244, and associated visual simulation.	
Description of Potential Plan Amendment	The Grand Junction RMP currently states the relevant objectives and planned management actions for visual resource management (page 2-21): Objective – To protect the quality of the scenic values on public land where visual resource management is an issue or where high value visual resources exist, and to protect areas having high scenic quality, visual sensitivity, and public visibility. Planned management actions: • Adopt the visual resource management classes as listed in Table 15 and shown on Map 15. Modify, relocate, mitigate, or deny proposed projects that conflict with the objectives of these classes. The following text will be added to the VRM Rationale as well as amend the VRM classes listed in Table 15 (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link C197 from Mileposts 2.4 to 2.5, 2.7 to 4.1, 4.5 to 4.7, 4.9 to 5.3, 6.3 to 6.6, 8.3 to 8.5, 9.0 to 9.1, and 11.1 to 14.6 of the Project (approximately 6.2 miles) would be amended to VRM Class IV (a total of 184 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Grand Junction RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link C197 6.2 miles

TABLE 5-11
BUREAU OF LAND MANAGEMENT GRAND JUNCTION FIELD OFFICE PLAN AMENDMENT GJFO1

Identification Number on Map 5-1b	🟩 GJFO1
Resource Management Plan	Grand Junction Field Office Record of Decision and Approved Resource Resource Management Plan, 2015 (Bureau of Land Management [BLM] 2015a)

Potential Environmental Effects

The following components of the Grand Junction Field Office Visual Resource Inventory (VRI) are located in the planning area boundary



Scenic Quality Rating Units: 141 acres of Class B and 43 acres of Class C lands
Sensitivity Level Rating Units: 100 acres of high, 41 acres of moderate, and 43 acres of low sensitivity lands
Distance Zones: 186 acres in the foreground-middleground distance zone
VRI Class: 100 acres of VRI Class II, 41 acres of VRI Class III, and 43 acres of VRI Class IV lands

Amendment of the land-use plan would result in the following changes to the overall Grand Junction Field Office VRM objectives:

COUT BAX-B: 184 fewer acres of VRM Class III (currently 180,481 acres) and 184 more acres of VRM Class IV (currently 838,499 acres)
COUT BAX-C: 184 fewer acres of VRM Class III (currently 180,481 acres) and 184 more acres of VRM Class IV (currently 838,499 acres)
COUT BAX-E: 184 fewer acres of VRM Class III (currently 180,481 acres) and 184 more acres of VRM Class IV (currently 838,499 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 184 acres adjacent to Garfield County Road 201 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: "The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements."

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-11
BUREAU OF LAND MANAGEMENT GRAND JUNCTION FIELD OFFICE
PLAN AMENDMENT GJFO1

Identification Number on Map 5-1b	🟩 GJFO1
Resource Management Plan	Grand Junction Field Office Record of Decision and Approved Resource Resource Management Plan, 2015 (Bureau of Land Management [BLM] 2015a)

Cumulative Effects

As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Grand Junction RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

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TABLE 5-12
COLORADO CANYONS NATIONAL CONSERVATION AREA PLAN AMENDMENT

Identification Number on Map 5-1b	Not applicable	
Resource Management Plan	Colorado Canyons (McInnis Canyons) National Conservation Area Resource Management Plan (Bureau of Land Management 2004c)	
Could Decision Require Amendment?	No	
Nonconformance Issue	None	
Description of Potential Plan Amendment	None	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable	Not applicable
Potential Environmental Effects		
Not applicable		

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TABLE 5-13 NATIONAL PARK SERVICE PLAN AMENDMENT		
Identification Number on Map 5-1b	Not applicable	
Resource Management Plan	National Park Service Dinosaur National Monument: Dinosaur National Monument General Management Plan (NPS 1986)	
Could Decision Require Amendment?	To be decided	
Nonconformance Issue	None	
Description of Potential Plan Amendment	None	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable	Not applicable
Potential Environmental Effects		
Not applicable		

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TABLE 5-14
BUREAU OF LAND MANAGEMENT SALT LAKE CITY FIELD OFFICE
PLAN AMENDMENT SLFO1

Identification Number on Map 5-1b	🟪 SLFO1		
Resource Management Plan	Salt Lake District, Record of Decision for the Pony Express Resource Management Plan and Rangeland Program Summary for Utah County (Bureau of Land Management 1990)		
Could Decision Require Amendment?	Yes		
Nonconformance Issue	The alternative routes traverse small parcels of lands administered by the Salt Lake Field Office not located in a designated utility corridor. According to the Pony Express Resource Management Plan Record of Decision (page 56) future proposals for major rights-of-way such as pipelines, large power lines, and permanent improved roads must use identified corridors. Otherwise, a planning amendment and appropriate environmental analysis will be required. Proposals that are not considered major may be sited outside corridors after demonstrating that locating in a corridor is not viable. In all cases, the utilization of ROW [right-of-way] in common shall be considered whenever possible.		
Description of Potential Plan Amendment	For Alternatives COUT-B and COUT-C (Agency and Applicant Preferred Alternative), the utility corridor decisions in the Pony Express Resource Management Plan Record of Decision page 56, Figure 10) would be amended to include the Project right-of-way as a utility corridor.		
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-A, COUT-B, and COUT-C COUT-C (Agency and Applicant Preferred Alternative)	Links U460 U621	 0.3 mile 0.1 mile
	Camp Timberlane/Argyle Canyon Variations 2 and 5	Link U515	 3.4 miles

Potential Environmental Effects

Direct and Indirect Effects

The direct and indirect effects on the resources attributed to amending the utility corridor width would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternatives COUT-A, COUT-B, and COUT-C (Agency and Applicant Preferred Alternative) in Chapter 3 (and Appendix F) since this amendment would allow the Project to be permitted on this route.

Cumulative Effects

Including the Project right-of-way as a utility corridor could allow additional utilities to be located in the corridor. If additional utilities are developed, such as the TransWest Express Project or other future extra-high-voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4.

Including the Project right-of-way as a utility corridor could allow increased access into an area previously closed to vehicular traffic.

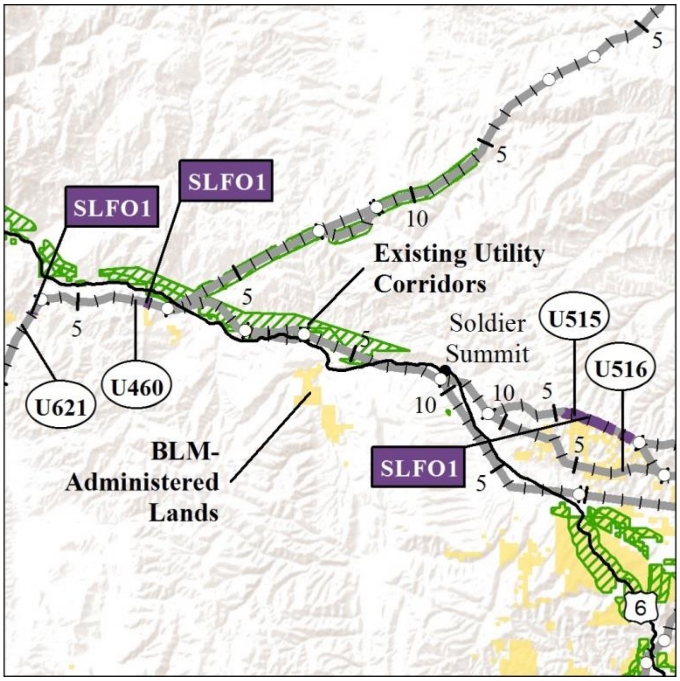
<table>
<tr><th colspan="2">TABLE 5-14
BUREAU OF LAND MANAGEMENT SALT LAKE CITY FIELD OFFICE
PLAN AMENDMENT SLFO1</th></tr>
<tr><td>Identification Number on Map 5-1b</td><td>🟪 SLFO1</td></tr>
<tr><td>Resource Management Plan</td><td>Salt Lake District, Record of Decision for the Pony Express Resource Management Plan and Rangeland Program Summary for Utah County (Bureau of Land Management 1990)</td></tr>
<tr><td>Including the Project right-of-way as a utility corridor could create a siting opportunity for future projects as this area would become more dominated by transmission lines, such as the TransWest Express Project or other future extra-high-voltage transmission lines if additional exceptions were granted. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.</td><td>
</td></tr>
</table>

TABLE 5-15
BUREAU OF LAND MANAGEMENT FILLMORE FIELD OFFICE PLAN AMENDMENT

Identification Number on Map 5-1b	Not applicable
Resource Management Plan	Richfield District House Range Resource Management Plan and Record of Decision Rangeland Program Summary (Bureau of Land Management 1987)
Could Decision Require Amendment?	No
Nonconformance Issue	Not applicable
Description of Potential Plan Amendment	None
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable

Potential Environmental Effects

Not applicable

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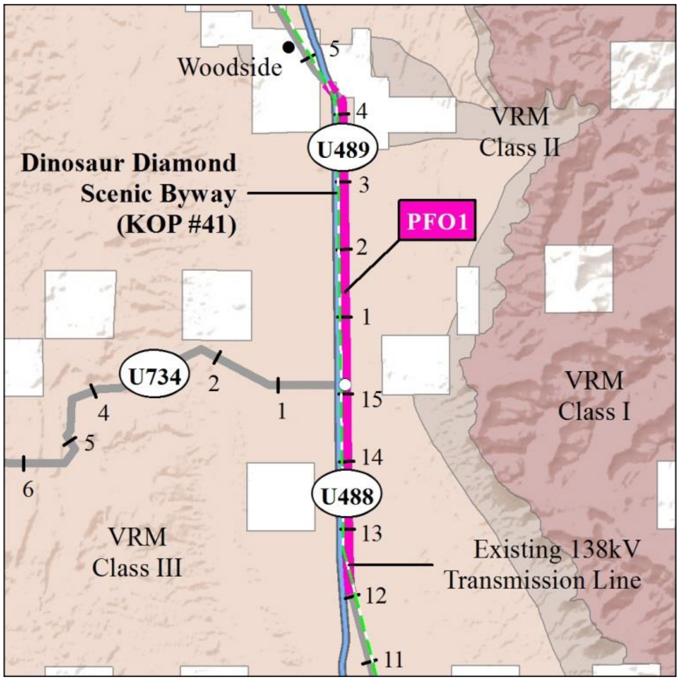
TABLE 5-16
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO1

Identification Number on Map 5-1b	🟪 PFO1
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
Could Decision Require Amendment?	Yes
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Dinosaur Diamond Scenic Byway (U.S. Highway 6) would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #41, and associated visual simulation.
Description of Potential Plan Amendment	The Price RMP currently states the relevant goals and objectives for visual resource management (page 77). Goals: • Identify scenic resources, integral landscapes, and vistas that contribute to the sense of place and quality of life of visitors and residents. Assign VRM classes to all landscapes. • Manage scenic resources, integral vistas, and landscapes for the benefit of local residents and visitors. • Identify acceptable levels of manmade contrast on area landscapes. Objectives: • Over the life of the plan management actions will be conducted in a manner that protects scenic values and landscapes through the use of the Visual Management System. • Use proper design techniques and mitigation measures, future projects and use authorizations under this plan to minimize contrast with the characteristic landscape and not exceed the VRM Management Class Standards. Additionally, specific management decisions are listed stating the VRM Class associated with different planning decisions. The following text will be added to amend the list of management decisions (***new text in bold italics, please note each amendment is associated with a particular Project alternative route***): COUT BAX-C ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U488 from Milepost 12.0 to 15.1 of the Project (approximately 3.1 miles) would be amended to VRM Class IV (a total of 95 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** COUT BAX-E ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U488 from Milepost 12.0 to 15.1 and Link U489 from Mileposts 0.0 to 4.2 and 4.3 to 4.5 of the Project (approximately 7.5 miles) would be amended to VRM Class IV (a total of 229 acres) for only those portions of the Project that would still exceed acceptable levels of***

TABLE 5-16
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO1

Identification Number on Map 5-1b	🟥 PFO1	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
	change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted. Amendment of this decision in the Price RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-C	Link U488 3.1 miles
	COUT BAX-E	Links U488 3.1 miles U489 4.4 miles

Potential Environmental Effects



The following components of the Price Field Office Visual Resource Inventory (VRI) are located in the planning area boundary :

COUT BAX-C:
Scenic Quality Rating Units: 95 acres of Class C lands
Sensitivity Level Rating Units: 95 acres of moderate sensitivity lands
Distance Zones: 95 acres in the foreground-middleground distance zone
VRI Class: 95 acres of VRI Class IV lands

COUT BAX-E:
Scenic Quality Rating Units: 229 acres of Class C lands
Sensitivity Level Rating Units: 229 acres of moderate sensitivity lands
Distance Zones: 229 acres in the foreground-middleground distance zone
VRI Class: 229 acres of VRI Class IV lands

Amendment of the land-use plan would result in the following changes to the overall Price Field Office VRM objectives:

COUT BAX-C: 95 fewer acres of VRM Class III (currently 1,248,000 acres) and 95 more acres of VRM Class IV (currently 291,000 acres)
COUT BAX-E: 229 fewer acres of VRM Class III (currently 1,248,000 acres) and 229 more acres of VRM Class IV (currently 291,000 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 95 or 229 acres (depending on the selected alternative route) adjacent to U.S. Highway 6 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: "The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic

<table>
<tr><th colspan="2">TABLE 5-16
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO1</th></tr>
<tr><td>Identification Number on Map 5-1b</td><td>🟪 PFO1</td></tr>
<tr><td>Resource Management Plan</td><td>Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)</td></tr>
<tr><td colspan="2">landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”
Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.
Cumulative Effects
As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.
By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Price RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.</td></tr>
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TABLE 5-17
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO2

Identification Number on Map 5-1b	🟪 PFO2	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Wedge Overlook/Buckhorn Draw Scenic Backway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #218.	
Description of Potential Plan Amendment	The Price RMP currently states the relevant goals and objectives for visual resource management (page 77). Goals: • Identify scenic resources, integral landscapes, and vistas that contribute to the sense of place and quality of life of visitors and residents. Assign VRM classes to all landscapes. • Manage scenic resources, integral vistas, and landscapes for the benefit of local residents and visitors. • Identify acceptable levels of manmade contrast on area landscapes. Objectives: • Over the life of the plan management actions will be conducted in a manner that protects scenic values and landscapes through the use of the Visual Management System. • Use proper design techniques and mitigation measures, future projects and use authorizations under this plan to minimize contrast with the characteristic landscape and not exceed the VRM Management Class Standards. Additionally, specific management decisions are listed stating the VRM Class associated with different planning decisions. The following text will be added to amend the list of management decisions (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U731 from Milepost 1.0 to 2.7 of the Project (approximately 1.7 miles) would be amended to VRM Class IV (a total of 51 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Price RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-B and COUT BAX-C	Link U731 1.7 miles

TABLE 5-17
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO2

Identification Number on Map 5-1b	🟪 PFO2
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)

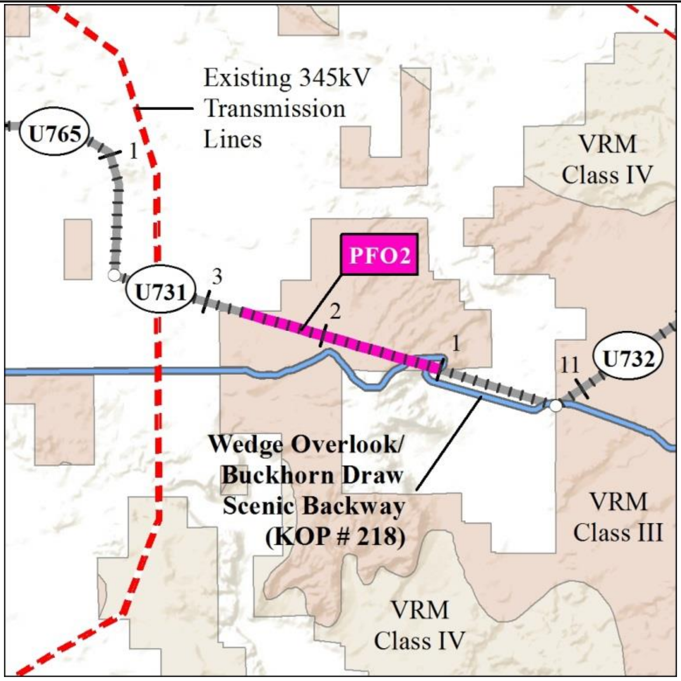
Potential Environmental Effects

The following components of the Price Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 51 acres of Class C lands
Sensitivity Level Rating Units: 45 acres of high and 6 acres of moderate sensitivity lands
Distance Zones: 51 acres in the foreground-middleground distance zone
VRI Class: 45 acres of VRI Class III and 6 acres of VRI Class IV lands

Amendment of the land-use plan would result in the following changes to the overall Price Field Office VRM objectives:

COUT BAX-B: 51 fewer acres of VRM Class III (currently 1,248,000 acres) and 51 more acres of VRM Class IV (currently 291,000 acres)
COUT BAX-C: 51 fewer acres of VRM Class III (currently 1,248,000 acres) and 51 more acres of VRM Class IV (currently 291,000 acres)


Existing 345kV Transmission Lines
U765
1
U731
3
2
PFO2
1
11
U732
VRM Class IV
Wedge Overlook/ Buckhorn Draw Scenic Backway (KOP # 218)
VRM Class III
VRM Class IV

Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 51 acres adjacent to this scenic backway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-17
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO2

Identification Number on Map 5-1b	🟪 PFO2
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Price RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

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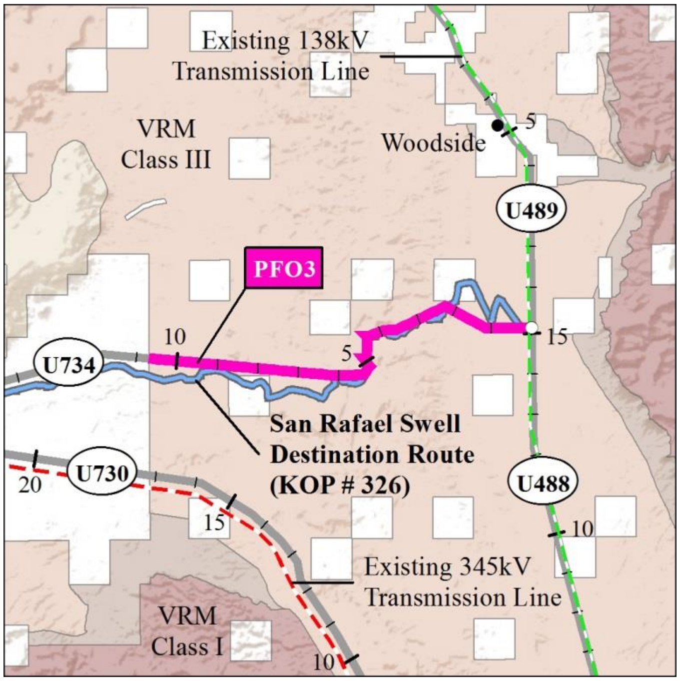
TABLE 5-18
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO3

Identification Number on Map 5-1b	🟪 PFO3	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the San Rafael Swell Destination Route (Green River Cutoff Road) would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #326.	
Description of Potential Plan Amendment	The Price RMP currently states the relevant goals and objectives for visual resource management (page 77). Goals: • Identify scenic resources, integral landscapes, and vistas that contribute to the sense of place and quality of life of visitors and residents. Assign VRM classes to all landscapes. • Manage scenic resources, integral vistas, and landscapes for the benefit of local residents and visitors. • Identify acceptable levels of manmade contrast on area landscapes. Objectives: • Over the life of the plan management actions will be conducted in a manner that protects scenic values and landscapes through the use of the Visual Management System. • Use proper design techniques and mitigation measures, future projects and use authorizations under this plan to minimize contrast with the characteristic landscape and not exceed the VRM Management Class Standards. Additionally, specific management decisions are listed stating the VRM Class associated with different planning decisions. The following text will be added to amend the list of management decisions (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U734 from Milepost 0.0 to 10.7 of the Project (approximately 10.7 miles) would be amended to VRM Class IV (a total of 324 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Price RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-C	Link U734 10.7 miles

TABLE 5-18
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO3

Identification Number on Map 5-1b	🟪 PFO3
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)

Potential Environmental Effects



The following components of the Price Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 271 acres of Class B, and 53 acres of Class C lands
Sensitivity Level Rating Units: 324 acres of moderate sensitivity lands
Distance Zones: 324 acres in the foreground-middleground distance zone
VRI Class: 271 acres of VRI Class III and 53 acres of VRI Class IV lands

Amendment of the land-use plan would result in the following changes to the overall Price Field Office VRM objectives:

COUT BAX-C: 324 fewer acres of VRM Class III (currently 1,248,000 acres) and 324 more acres of VRM Class IV (currently 291,000 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which the BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 324 acres adjacent to Green River Cutoff Road were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-18
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO3

Identification Number on Map 5-1b	🟪 PFO3
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)

Cumulative Effects

As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Price RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

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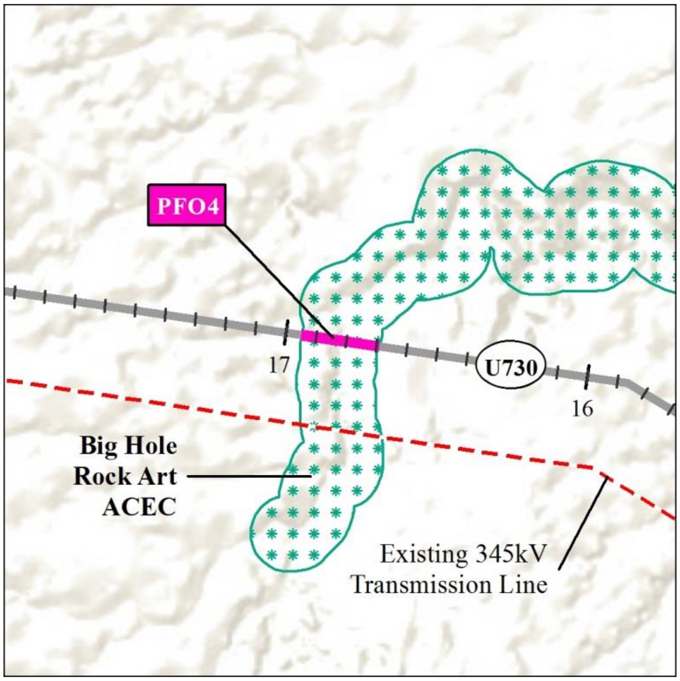
TABLE 5-19
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO4

Identification Number on Map 5-1b	🟪 PFO4	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Crosses Big Hole Rock Art Area of Critical Environmental Concern, an exclusion area for new utility corridors.	
Description of Potential Plan Amendment	Special management prescriptions in Special Designations section of the Approved Resource Management Plan, under the subheading *Rock Art Area of Critical Environmental Concern* (page 136) would be amended as follows (***new text in bold italics):*** Manage with the following special management prescriptions: • Oil and gas will be open to leasing subject to major constraints (NSO) • Closed to disposal of mineral materials • Recommended for withdrawal from locatable mineral entry • Excluded for [right-of-way] grants. ***This stipulation could be granted an exception by the Field Manager if conditions warrant and the decision is documented through environmental analysis. An exception would suspend the stipulation on a one-time basis.***	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-B	Link U730 0.2 mile

Potential Environmental Effects



Direct and Indirect Effects
The direct and indirect effects on the resources attributed to amending the stipulation to grant a one-time exception would be same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternative COUT BAX-B in Chapter 3 since this amendment would allow the Project to be permitted on this route.

Cumulative Effects
Cumulative effects from allowing a one-time exception would likely result in similar cumulative effects on resources from this Project in Chapter 4.

Allowing a one-time exception could create a siting opportunity for future projects as this area would become more dominated by transmission lines, such as the TransWest Express Project or other future extra-high-voltage transmission lines if additional exceptions were granted. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.

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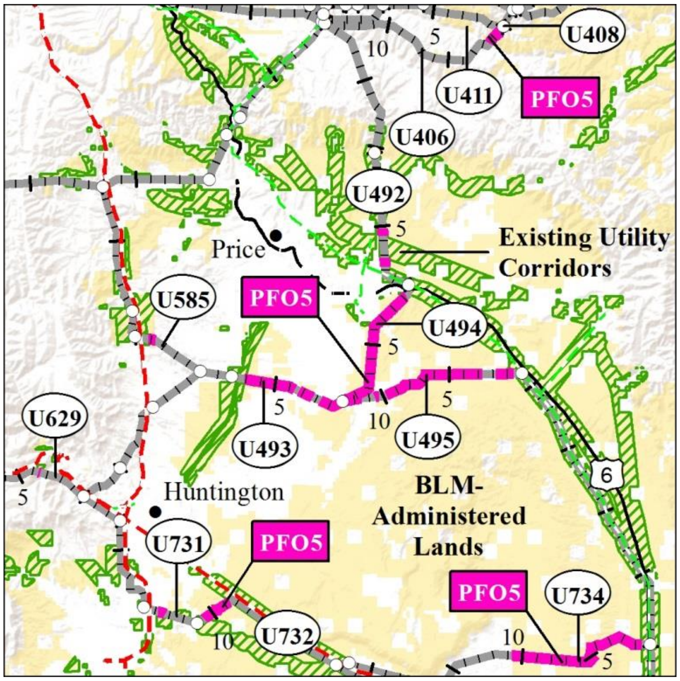
TABLE 5-20
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO5

Identification Number on Map 5-1b	🟪 PFO5	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	New utility corridors in these areas will require a potential land-use plan amendment.	
Description of Potential Plan Amendment	The right-of-way decision presented in in the Lands and Realty section of the BLM Price approved Resource Management Plan (RMP) under LAR-23 (page 122) would be amended as follows (***new text in bold italics):*** LAR-23 All utility corridors within the PFO [Price Field Office] are designated for any size utility and transportation uses needed. The corridors are 1 mile in width crossing any BLM-administered public lands***, with the exception of the utility corridor established along Interstate 70 (I-70), which is 1.5 miles in width.*** These approved corridors will be the preferred location for future major linear [rights-of-way] that meet the following criteria: • Pipelines with a diameter greater than 16 inches • Transmission (not distribution) lines with a voltage capacity of 69 kV or greater • Significant conduits requiring a permanent width greater than 50 feet. Map R-21 in the approved RMP also would be revised to show the amended corridor width along I-70.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT BAX-B	Links U629 0.1 mile U730 0.2 mile U731 0.5 mile U732 2.1 miles
	COUT BAX-C	Links U629 0.1 mile U731 0.5 mile U732 2.1 miles U734 10.1 miles
	COUT BAX-E	Links U493 6.1 miles U495 9.9 miles U485 0.4 mile U585 0.5 mile
	COUT-C (Agency and Applicant Preferred Alternative), Camp Timberlane/Argyle Canyon Variations 1 and 2	Links U406 1.2 miles U408 0.1 mile

TABLE 5-20
BUREAU OF LAND MANAGEMENT PRICE FIELD OFFICE PLAN AMENDMENT PFO5

Identification Number on Map 5-1b	🟪 PFO5	
Resource Management Plan	Price Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008d)	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-H	Links U406 1.2 miles U408 0.1 mile
	COUT-I	Links U406 1.2 miles U408 0.1 mile U492 1.1 miles U493 6.1 miles U494 9.2 miles U629 0.1 mile

Potential Environmental Effects



Direct and Indirect Effects
The direct and indirect effects on the resources attributed to amending the width of the existing utility corridor to allow additional utilities, such as the Project, would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Alternatives COUT BAX-B, COUT BAX-C, COUT BAX-E, COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I, and Camp Timberlane/Argyle Canyon Variations 1 and 2 in Chapter 3 (and Appendix F) since this amendment would allow the Project to be permitted on this route.

Cumulative Effects
Cumulative effects from amending the corridor width would likely result in similar cumulative effects on resources from this Project in Chapter 4.

By amending the land-use plan to modify the utility corridor width, the Project or other future extra-high-voltage transmission lines could be sited in these lands and these areas would become more dominated by transmission lines. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.

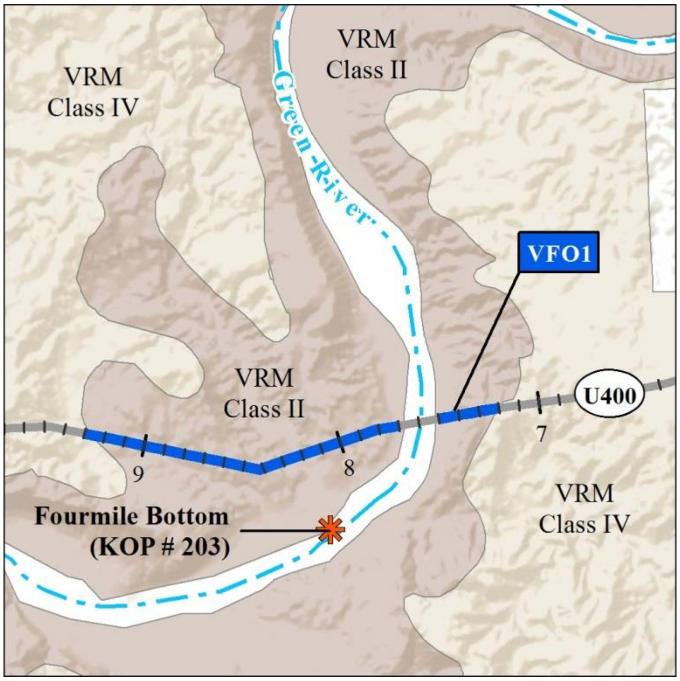
TABLE 5-21
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO1

Identification Number on Map 5-1b	🟦 VFO1
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Could Decision Require Amendment?	Yes
Nonconformance Issue	New utilities must cross the Green River at Fourmile Bottom. The alternative route crosses in the designated area, which also is designated as Visual Resource Management (VRM) Class II. Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Green River at Fourmile Bottom would not be compliant with VRM Class II objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #203, and associated visual simulation.
Description of Potential Plan Amendment	The Vernal RMP currently states the relevant goals and objectives for visual resource management (page 136). Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands. Additionally, specific management decisions are listed by VRM Class including VRM-4, which states “Approximately 786,612 acres will be managed as VRM Class III.” The following text will be added to amend management decision VRM-4 (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class II lands (associated with the Lower Green River Corridor Area of Critical Environmental Concern) along Link U400 from Mileposts 7.2 to 7.5 and 7.7 to 9.3 of the Project (approximately 1.9 miles) would be amended to VRM Class III (a total of 58 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class II after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.

TABLE 5-21
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO1

Identification Number on Map 5-1b	🟦 VFO1	
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I	Link U400 1.9 miles

Potential Environmental Effects



The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 8 acres of Class A and 50 acres of Class C lands
Sensitivity Level Rating Units: 58 acres of high sensitivity lands
Distance Zones: 58 acres in the foreground-middleground distance zone
VRI Class: 8 acres of VRI Class II and 50 acres of VRI Class III lands

Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives:

COUT-C (Agency and Applicant Preferred Alternative): 58 fewer acres of VRM Class II (currently 231,911 acres) and 58 more acres of VRM Class III (currently 786,612 acres)
COUT-H: 58 fewer acres of VRM Class II (currently 231,911 acres) and 58 more acres of VRM Class III (currently 786,612 acres)
COUT-I: 58 fewer acres of VRM Class II (currently 231,911 acres) and 58 more acres of VRM Class III (currently 786,612 acres)

Direct and Indirect Effects

This area is currently managed as VRM Class II, which BLM Manual 8410-1 describes as retaining the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract attention from the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 58 acres adjacent to the Green River were amended from VRM Class II to VRM Class III, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: "The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape."

Amending a portion of the VRM Class designation from the existing VRM Class II to VRM Class III would allow changes to the characteristic landscape to increase from needing to retain landscape character to instead accept activities to only partially retain landscape character. Management activities that under the existing VRM Class should not attract attention would be allowed to attract attention as long as views would not be dominated. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-21
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO1

Identification Number on Map 5-1b	🟦 VFO1
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Cumulative Effects As currently managed as VRM Class II, the Project and other reasonably foreseeable future actions (RFFA) that could moderately contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class II objectives through application of mitigation measures. By amending the land-use plan to change the VRM designation of this area to VRM Class III, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

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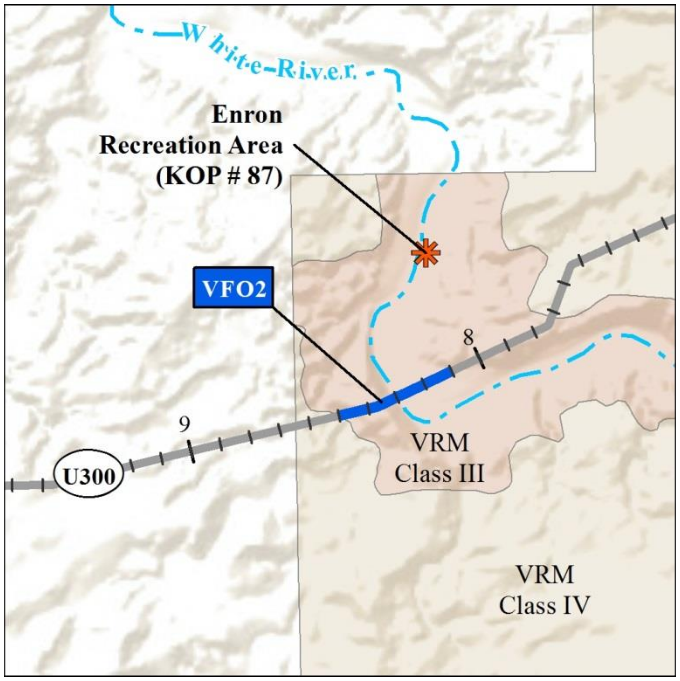
TABLE 5-22 BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO2		
Identification Number on Map 5-1b	🟦 VFO2	
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Enron Recreation Area would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Worksheet, Key Observation Point #87, and associated visual simulations.	
Description of Potential Plan Amendment	The Vernal RMP currently states the relevant goals and objectives for visual resource management (page 136). Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands. Additionally, specific management decisions are listed by VRM Class including VRM-5 which states “Approximately 643,641 acres will be managed as VRM Class IV.” The following text will be added to amend management decision VRM-5 (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U300 from Milepost 8.1 to 8.5 of the Project (approximately 0.4 mile) would be amended to VRM Class IV (a total of 12 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I	Link U300 0.4 mile

TABLE 5-22
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO2

Identification Number on Map 5-1b	🟦 VFO2
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)

Potential Environmental Effects



The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 11 acres of Class A and 1 acre of Class C lands
Sensitivity Level Rating Units: 12 acres of moderate sensitivity lands
Distance Zones: 12 acres in the foreground-middleground distance zone
VRI Class: 11 acres of VRI Class II and 1 acre of VRI Class IV lands

Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives:

COUT-C (Agency and Applicant Preferred Alternative): 12 fewer acres of VRM Class III (currently 786,612 acres) and 12 more acres of VRM Class IV (currently 643,641 acres)
COUT-H: 12 fewer acres of VRM Class III (currently 786,612 acres) and 12 more acres of VRM Class IV (currently 643,641 acres)
COUT-I: 12 fewer acres of VRM Class III (currently 786,612 acres) and 12 more acres of VRM Class IV (currently 643,641 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which the BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 12 acres adjacent to the White River were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-22
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO2

Identification Number on Map 5-1b	🟦 VFO2
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

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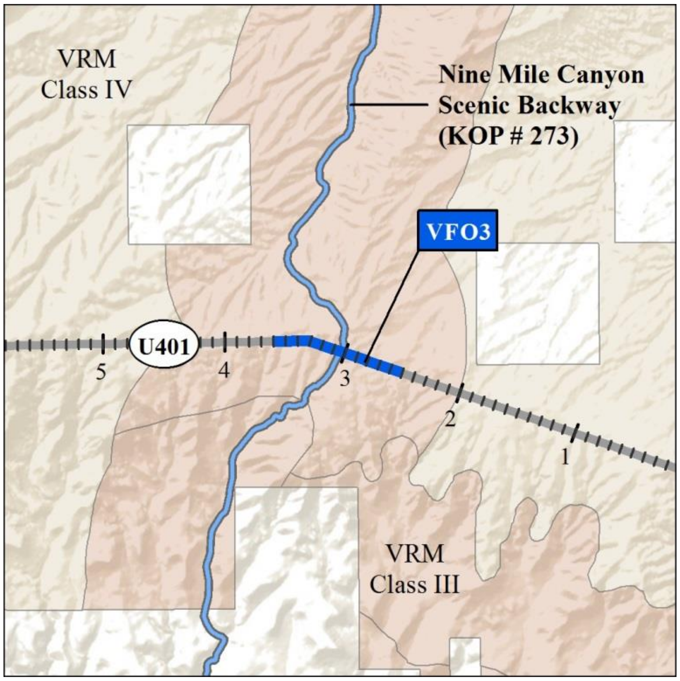
<table>
<tr><th colspan="3">TABLE 5-23
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO3</th></tr>
<tr><td>**Identification Number on Map 5-1b**</td><td colspan="2">🟦 VFO3</td></tr>
<tr><td>**Resource Management Plan**</td><td colspan="2">Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)</td></tr>
<tr><td>**Could Decision Require Amendment?**</td><td colspan="2">Yes</td></tr>
<tr><td>**Nonconformance Issue**</td><td colspan="2">Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of crossing the Nine Mile Canyon Scenic Backway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #273.</td></tr>
<tr><td>**Description of Potential Plan Amendment**</td><td colspan="2">The Vernal RMP currently states the relevant goals and objectives for visual resource management (page 136).
Goals and Objectives:
• Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important.
• In their impact on the quality of life for residents and communities in the areas.
• In their contribution to the quality of recreational visitor experiences.
• In supporting the regional tourism industry and segments of the local economy dependent on public land resources.
• Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands.
Additionally, specific management decisions are listed by VRM Class including VRM-5, which states “Approximately 643,641 acres will be managed as VRM Class IV.” The following text will be added to amend management decision VRM-5 (***new text in bold italics***):
The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U401 from Milepost 2.5 to 3.6 of the Project (approximately 1.1 miles) would be amended to VRM Class IV (a total of 33 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.
Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.</td></tr>
<tr><td>**Alternative Routes (Link[s]) Relevant to Potential Plan Amendment**</td><td>COUT-C (Agency and Applicant Preferred Alternative), COUT-H, COUT-I</td><td>Link
U401 1.1 miles</td></tr>
</table>

TABLE 5-23
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO3

Identification Number on Map 5-1b	🟦 VFO3
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)

Potential Environmental Effects



The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located in the planning area boundary :

Scenic Quality Rating Units: 33 acres of Class B lands
Sensitivity Level Rating Units: 33 acres of high sensitivity lands
Distance Zones: 33 acres in the foreground-middleground distance zone
VRI Class: 33 acres of VRI Class II lands

Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives:

COUT-C (Agency and Applicant Preferred Alternative): 33 fewer acres of VRM Class III (currently 786,612 acres) and 33 more acres of VRM Class IV (currently 643,641 acres)
COUT-H: 33 fewer acres of VRM Class III (currently 786,612 acres) and 33 more acres of VRM Class IV (currently 643,641 acres)
COUT-I: 33 fewer acres of VRM Class III (currently 786,612 acres) and 33 more acres of VRM Class IV (currently 643,641 acres)

Direct and Indirect Effects

This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 33 acres adjacent to this scenic backway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-23
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO3

Identification Number on Map 5-1b	🟦 VFO3
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)
Cumulative Effects As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures. By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.	

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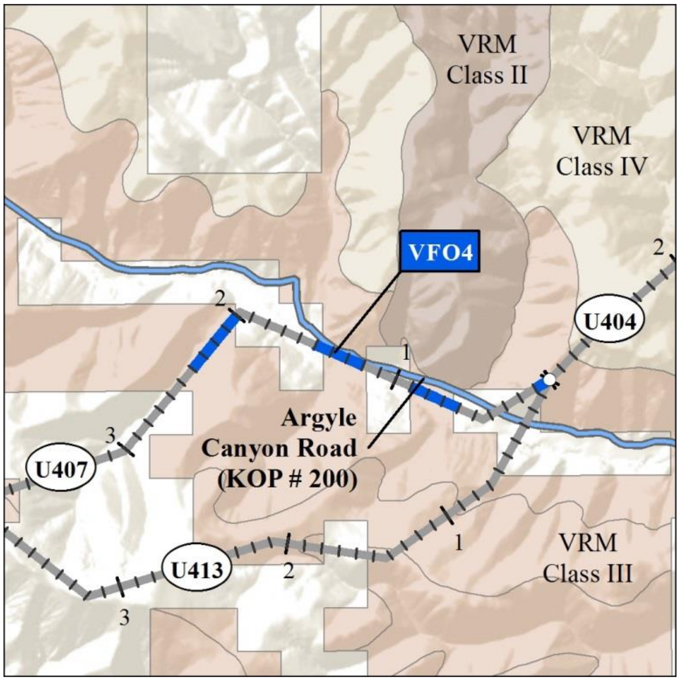
TABLE 5-24
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO4

Identification Number on Map 5-1b	🟦 VFO4	
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Argyle Canyon Road would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheets, Key Observation Point #200, and associated visual simulation.	
Description of Potential Plan Amendment	The Vernal RMP currently states the relevant goals and objectives for visual resource management (page 136. Goals and Objectives: • Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important. • In their impact on the quality of life for residents and communities in the areas. • In their contribution to the quality of recreational visitor experiences. • In supporting the regional tourism industry and segments of the local economy dependent on public land resources. • Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands. Additionally, specific management decisions are listed by VRM Class including VRM-5, which states "Approximately 643,641 acres will be managed as VRM Class IV." The following text will be added to amend the management decision VRM-5 (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U407 from Mileposts 0.0 to 0.1, 0.6 to 0.9, 1.2 to 1.5, and 2.0 to 2.4 of the Project (approximately 1.1 miles) would be amended to VRM Class IV (a total of 33 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-H, COUT-I, and Argyle Ridge Variation 1	Links U407 1.1 miles

TABLE 5-24
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO4

Identification Number on Map 5-1b	🟦 VFO4
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)

Potential Environmental Effects



The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 33 acres of Class A lands
Sensitivity Level Rating Units: 33 acres of high sensitivity lands
Distance Zones: 33 acres in the foreground-middleground distance zone
VRI Class: 33 acres of VRI Class II lands

Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives::

COUT-C (Agency and Applicant Preferred Alternative): 33 fewer acres of VRM Class III (currently 786,612 acres) and 33 more acres of VRM Class IV (currently 643,641 acres)
COUT-H: 33 fewer acres of VRM Class III (currently 786,612 acres) and 33 more acres of VRM Class IV (currently 643,641 acres)
COUT-I: 33 fewer acres of VRM Class III (currently 786,612 acres) and 33 more acres of VRM Class IV (currently 643,641 acres)

Direct and Indirect Effects

This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 33 acres adjacent to Argyle Canyon Road were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-24
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO4

Identification Number on Map 5-1b	🟦 VFO4
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)

Cumulative Effects

As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

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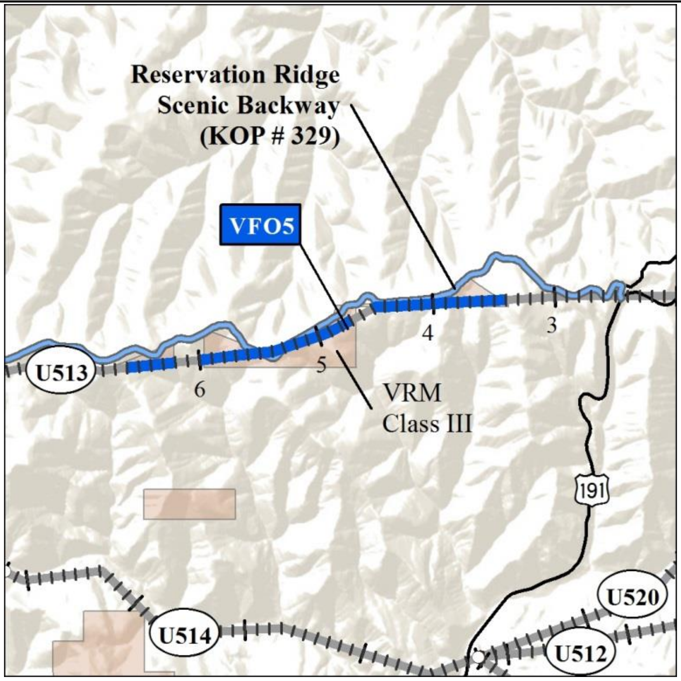
TABLE 5-25
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO5

<table>
<tr><td>Identification Number on Map 5-1b</td><td colspan="2">🟦 VFO5</td></tr>
<tr><td>Resource Management Plan</td><td colspan="2">Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)</td></tr>
<tr><td>Could Decision Require Amendment?</td><td colspan="2">Yes</td></tr>
<tr><td>Nonconformance Issue</td><td colspan="2">Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling the Reservation Ridge Scenic Backway would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #329.</td></tr>
<tr><td>Description of Potential Plan Amendment</td><td colspan="2">The Vernal RMP currently states the relevant goals and objectives for visual resource management (page 136).
Goals and Objectives:
• Manage the public lands (see Figure 16a) in such a way to preserve those scenic vistas, which are deemed to be most important.
• In their impact on the quality of life for residents and communities in the areas.
• In their contribution to the quality of recreational visitor experiences.
• In supporting the regional tourism industry and segments of the local economy dependent on public land resources.
• Seek to complement the rural, agricultural, historic, and urban landscapes on adjoining private, state, and tribal lands by maintaining the integrity of background vistas on the public lands.
Additionally, specific management decisions are listed by VRM Class including VRM-5 which states “Approximately 643,641 acres will be managed as VRM Class IV.” The following text will be added to amend management decision VRM-5 (<i>new text in bold italics</i>):
<i>The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U513 from Mileposts 3.4 to 4.5, 4.7 to 6.0, and 6.2 to 6.6 of the Project (approximately 2.8 miles) would be amended to VRM Class IV (a total of 84 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.</i>
Amendment of this decision in the Vernal RMP would facilitate accommodation of the Project with revised plan VRM objectives.</td></tr>
<tr><td>Alternative Routes (Link[s]) Relevant to Potential Plan Amendment</td><td>Camp Timberlane/Argyle Canyon Variation 5</td><td>Link
U513 2.8 miles</td></tr>
</table>

TABLE 5-25
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO5

Identification Number on Map 5-1b	🟦 VFO5
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)

Potential Environmental Effects



The following components of the Vernal Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 84 acres of Class A lands
Sensitivity Level Rating Units: 84 acres of high sensitivity lands
Distance Zones: 84 acres in the foreground-middleground distance zone
VRI Class: 84 acres of VRI Class II lands

Amendment of the land-use plan would result in the following changes to the overall Vernal Field Office VRM objectives:

Camp Timberlane/Argyle Canyon Variation 5: 84 fewer acres of VRM Class III (currently 786,612 acres) and 84 more acres of VRM Class IV (currently 643,641 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which the BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 84 acres adjacent to this scenic backway were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-25
BUREAU OF LAND MANAGEMENT VERNAL FIELD OFFICE PLAN AMENDMENT VFO5

Identification Number on Map 5-1b	🟦 VFO5
Resource Management Plan	Vernal Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008f)

Cumulative Effects

As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Vernal RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

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TABLE 5-26 BUREAU OF LAND MANAGEMENT RICHFIELD FIELD OFFICE PLAN AMENDMENT		
Identification Number on Map 5-1b	Not applicable	
Resource Management Plan	Richfield Field Office, Record of Decision and Approved Resource Management Plan (Bureau of Land Management 2008e)	
Could Decision Require Amendment?	No	
Nonconformance Issue	Not applicable	
Description of Potential Plan Amendment	None	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Not applicable	Not applicable
Potential Environmental Effects		
Not applicable		

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TABLE 5-27
BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO1

Identification Number on Map 5-1b	🟫 MFO1	
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Old U.S. Highway 6 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #245.	
Description of Potential Plan Amendment	The Moab RMP currently states the relevant goals and objectives for visual resource management (page 135). Goals and Objectives: • Manage public lands in a manner that protects the quality of scenic values. • Recognize and manage visual resource for overall multiple use, filming, and recreational opportunities for visitors to public lands. • Manage BLM actions to preserve those scenic vistas that are most important, Additionally, specific management decisions are listed. The following text will be add to amend the management decisions to include a new management decision, VRM-15 (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U490 from Milepost 0.0 to 6.3 of the Project (approximately 6.3 mile) would be amended to VRM Class IV (a total of 189 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Moab RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link U490 6.3 miles

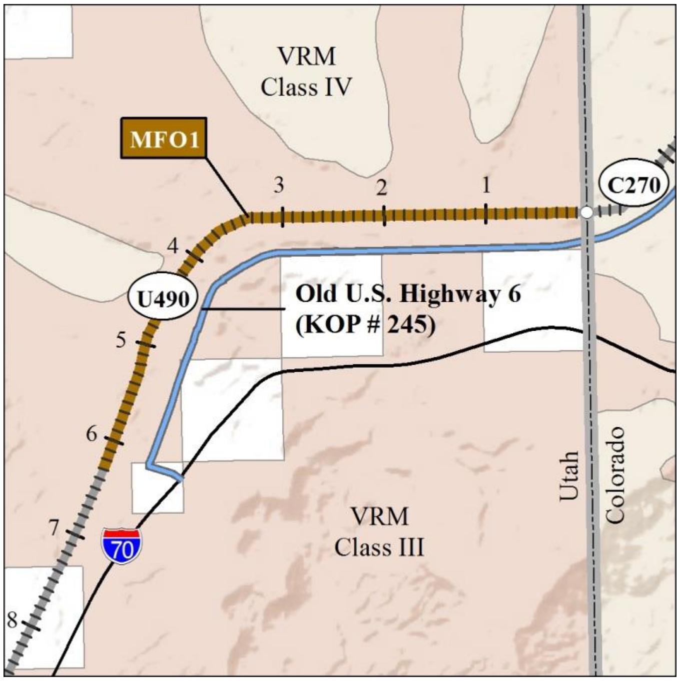
TABLE 5-27
BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO1

Identification Number on Map 5-1b	🟫 MFO1
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)

Potential Environmental Effects

The following components of the Moab Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 189 acres of Class C lands
Sensitivity Level Rating Units: 74 acres of moderate and 115 acres of low sensitivity lands
Distance Zones: 189 acres in the foreground-middleground distance zone
VRI Class: 189 acres of VRI Class IV lands



Amendment of the land-use plan would result in the following changes to the overall Moab Field Office VRM objectives:

COUT BAX-B: 189 fewer acres of VRM Class III (currently 829,158 acres) and 189 more acres of VRM Class IV (currently 268,133 acres)
COUT BAX-C: 189 fewer acres of VRM Class III (currently 829,158 acres) and 189 more acres of VRM Class IV (currently 268,133 acres)
COUT BAX-E: 189 fewer acres of VRM Class III (currently 829,158 acres) and 189 more acres of VRM Class IV (currently 268,133 acres)

Direct and Indirect Effects
This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 189 acres adjacent to Old U.S. Highway 6 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

TABLE 5-27 BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO1	
Identification Number on Map 5-1b	🟫 MFO1
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)

Cumulative Effects

As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Moab RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

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TABLE 5-28
BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO2

Identification Number on Map 5-1b	🟫 MFO2	
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects resulting from the proximity of the Project to the Harley Dome Rest Area (along I-70) would not be compliant with Visual Resource Management Class (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #152, and associated visual simulation.	
Description of Potential Plan Amendment	The Moab RMP currently states the relevant goals and objectives for visual resource management (page 135). Goals and Objectives: • Manage public lands in a manner that protects the quality of scenic values. • Recognize and manage visual resource for overall multiple use, filming, and recreational opportunities for visitors to public lands. • Manage BLM actions to preserve those scenic vistas that are most important, Additionally, specific management decisions are listed. The following text will be add to amend the management decisions to include a new management decision, VRM-15 (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U490 from Milepost 4.3 to 5.3 of the Project (approximately 1.0 mile) would be amended to VRM Class IV (a total of 31 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Moab RMP would facilitate accommodation of the Project with revised plan VRM objectives.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Link U490 1.0 mile

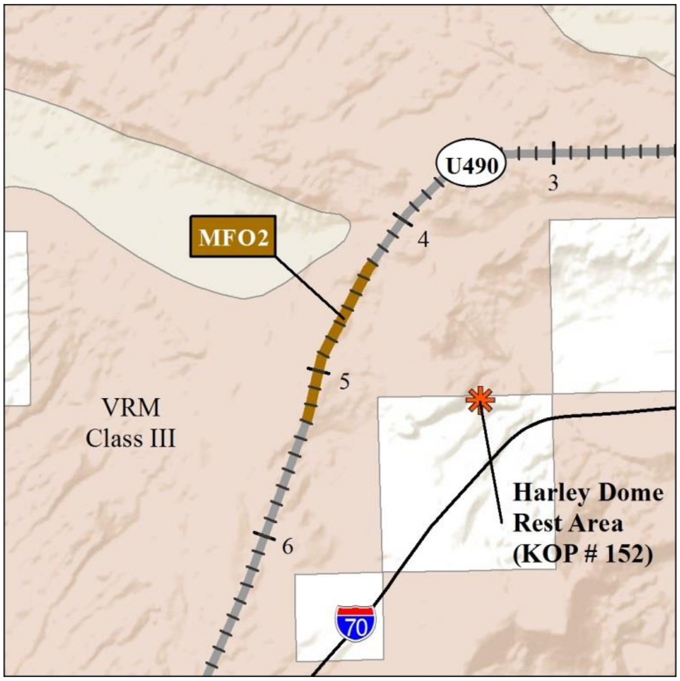
Potential Environmental Effects

The following components of the Moab Field Office Visual Resource Inventory (VRI) are located in the planning area boundary :

Scenic Quality Rating Units: 31 acres of Class C lands
Sensitivity Level Rating Units: 16 acres of moderate and 15 acres of low sensitivity lands
Distance Zones: 31 acres in the foreground-middleground distance zone
VRI Class: 31 acres of VRI Class IV lands

TABLE 5-28
BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO2

Identification Number on Map 5-1b	🟫 MFO2
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)



Amendment of the land-use plan would result in the following changes to the overall Moab Field Office VRM objectives:

COUT BAX-B: 31 fewer acres of VRM Class III (currently 829,158 acres) and 31 more acres of VRM Class IV (currently 268,133 acres)
COUT BAX-C: 31 fewer acres of VRM Class III (currently 829,158 acres) and 31 more acres of VRM Class IV (currently 268,133 acres)
COUT BAX-E: 31 fewer acres of VRM Class III (currently 829,158 acres) and 31 more acres of VRM Class IV (currently 268,133 acres)

Direct and Indirect Effects

This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 31 acres adjacent to the Harley Dome Rest Area were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

Cumulative Effects

As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Moab RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

TABLE 5-29
BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO3

Identification Number on Map 5-1b	🟫 MFO3
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)
Could Decision Require Amendment?	Yes
Nonconformance Issue	Because of the level of visual contrast produced by the Project, after the application of appropriate selective mitigation measures, the visual effects of paralleling Interstate 70 would not be compliant with Visual Resource Management (VRM) Class III objectives established in the resource management plan (RMP) for the area. Refer to Appendix M – Contrast Rating Worksheet, Key Observation Point #246.
Description of Potential Plan Amendment	The Moab RMP currently states the relevant goals and objectives for visual resource management (page 135). Goals and Objectives: • Manage public lands in a manner that protects the quality of scenic values. • Recognize and manage visual resource for overall multiple use, filming, and recreational opportunities for visitors to public lands. • Manage BLM actions to preserve those scenic vistas that are most important, Additionally, specific management decisions are listed. The following text will be add to amend the management decisions to include a new management decision, VRM-15 (***new text in bold italics***): ***The portion of the 250-foot-wide right-of-way for the Energy Gateway South Transmission Project in VRM Class III lands along Link U490 from Mileposts 6.3 to 7.3, 8.5 to 12.0, 12.4 to 13.5, 13.8 to 16.3, 16.8 to 24.9, and 25.3 to 25.7 and Link U486 Milepost 0.0 to 1.8 of the Project (approximately 18.4 miles) would be amended to VRM Class IV (a total of 558 acres) for only those portions of the Project that would still exceed acceptable levels of change that could occur in VRM Class III after application of all feasible measures to reduce impacts on visual resources is exhausted.*** Amendment of this decision in the Moab RMP would facilitate accommodation of the Project with revised plan VRM objectives.
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	All COUT BAX alternative routes	Links U490 16.6 miles U486 1.8 miles

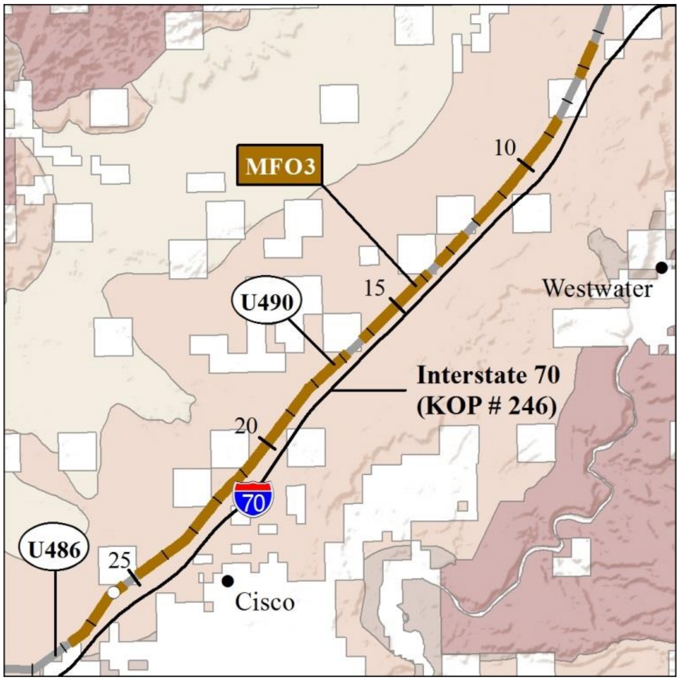
Potential Environmental Effects

The following components of the Moab Field Office Visual Resource Inventory (VRI) are located in the planning area boundary:

Scenic Quality Rating Units: 558 acres of Class C lands
Sensitivity Level Rating Units: 558 acres of moderate sensitivity lands
Distance Zones: 558 acres in the foreground-middleground distance zone
VRI Class: 558 acres of VRI Class IV lands

TABLE 5-29
BUREAU OF LAND MANAGEMENT MOAB FIELD OFFICE PLAN AMENDMENT MFO3

Identification Number on Map 5-1b	🟫 MFO3
Resource Management Plan	Moab Field Office Record of Decision and Approved Resource Management Plan (Bureau of Land Management [BLM] 2008c)



Amendment of the land-use plan would result in the following changes to the overall Moab Field Office VRM objectives:

COUT BAX-B: 558 fewer acres of VRM Class III (currently 829,158 acres) and 558 more acres of VRM Class IV (currently 268,133 acres)
COUT BAX-C: 558 fewer acres of VRM Class III (currently 829,158 acres) and 558 more acres of VRM Class IV (currently 268,133 acres)
COUT BAX-E: 558 fewer acres of VRM Class III (currently 829,158 acres) and 558 more acres of VRM Class IV (currently 268,133 acres)

Direct and Indirect Effects

This area is currently managed as VRM Class III, which BLM Manual 8410-1 describes as partially retaining the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 558 acres adjacent to Interstate 70 were amended from VRM Class III to VRM Class IV, then the VRM objective would be amended in accordance with the description provided in BLM Manual 8410-1: “The objective of this class is to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.”

Amending a portion of the VRM Class designation from the existing VRM Class III to VRM Class IV would allow changes to the characteristic landscape to increase from needing to partially retain landscape character to instead accept major modification of the landscape character. Management activities that under the existing VRM Class could attract attention but not dominate the view would be allowed to dominate the view and be a major focus of viewer attention. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

Cumulative Effects

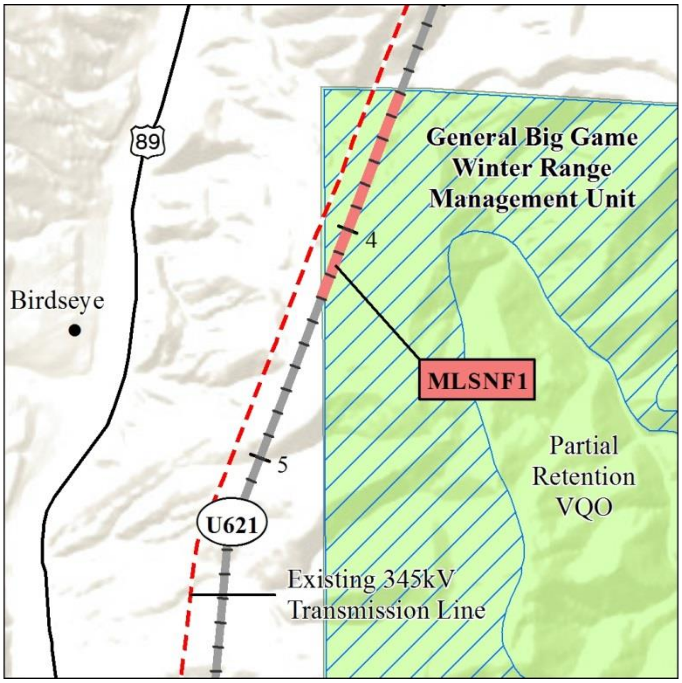
As currently managed as VRM Class III, the Project and other reasonably foreseeable future actions (RFFA) that could highly contrast with the existing landscape character would not be permitted in this area unless determined to meet existing VRM Class III objectives through application of mitigation measures.

By amending the land-use plan to change the VRM designation of this area to VRM Class IV, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Moab RMP could be amended to change the VRM designation of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

TABLE 5-30
MANTI-LA SAL NATIONAL FOREST PLAN AMENDMENT MLSNF1

Identification Number on Map 5-1b	🟥 MLSNF1	
Resource Management Plan	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (U.S. Forest Service [USFS] 1986b)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Per a standard for the General Big-game Winter Range Management Unit (management emphasis is on general big-game winter range) in the 1986 Manti-La Sal National Forest Land and Resource Management Plan (LRMP) activities must meet the Visual Quality Objective (VQO) except where habitat improvement activities occur (Management Activity AO4, page III-62 of LRMP). Due to the proximity of the Project to U.S. Highway 89 and residences in the area of Birdseye, Utah, the Project would not be subordinate to the characteristic landscape in these areas, which would be inconsistent with the definition of a partial retention VQO.	
Description of Potential Plan Amendment	The area in the Project right-of-way that is inconsistent with a partial retention VQO and could not be mitigated through application of selective mitigation measures (Link U621 Milepost 3.4 to 4.3) would be amended from a partial retention VQO to a modification VQO.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	COUT-A, COUT-B, COUT-C (Agency and Applicant Preferred Alternative)	Link U621 0.9 mile
Management Areas Crossed[1]	Areas 1 and 2	

Potential Environmental Effects


89
General Big Game Winter Range Management Unit
4
Birdseye
MLSNF1
Partial Retention VQO
5
U621
Existing 345kV Transmission Line

The following changes to the overall Manti-La Sal National Forest Visual Management System VQOs would occur through the amendment of this area:

COUT-A: 27 fewer acres of a partial retention VQO (currently 186,012 acres) and 27 more acres of a modification VQO (currently 66,070 acres)
COUT-B: 27 fewer acres of a partial retention VQO (currently 186,012 acres) and 27 more acres of a modification VQO (currently 66,070 acres)
COUT-C (Agency and Applicant Preferred Alternative): 27 fewer acres of a partial retention VQO (currently 186,012 acres) and 27 more acres of a modification VQO (currently 66,070 acres)

Direct and Indirect Effects
This area is currently managed as a partial retention VQO, which USFS Handbook 462 describes as an area where management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, and texture common to the characteristic landscape; but changes in their qualities of sizes, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape. Activities also may introduce form, line, color, or texture found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength

TABLE 5-30
MANTI-LA SAL NATIONAL FOREST PLAN AMENDMENT MLSNF1

Identification Number on Map 5-1b	🟥 MLSNF1
Resource Management Plan	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (U.S. Forest Service [USFS] 1986b)

of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 27 acres near U.S. Highway 89 and the community of Birdseye were amended from a partial retention VQO to a modification VQO, then the VQO would be amended in accordance with the description provided in USFS Handbook 462: “Management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences in the surrounding area or character type. Additional parts of these activities such as structures, roads, slash, root wads, etc., must remain visually subordinate to the proposed composition. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings.”

Amending a portion of the VQO designation from the existing partial retention VQO to a modification VQO would allow changes to the characteristic landscape to increase from needing to remain visually subordinate to instead management activities that may visually dominate the characteristic landscape. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

Cumulative Effects
As currently managed as a partial retention VQO, the Project and other reasonably foreseeable future actions (RFFA) that could visually dominate the characteristic landscape would not be permitted in this area unless determined to meet existing objectives through application of mitigation measures.

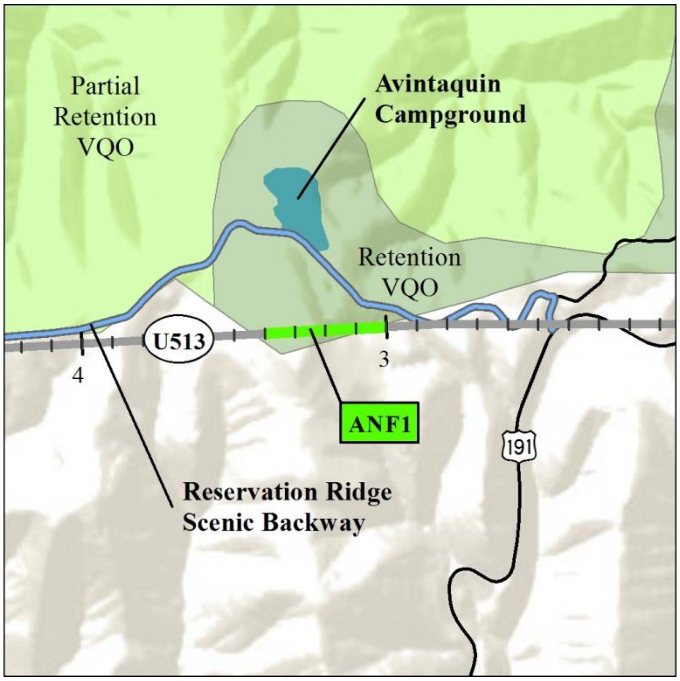
By amending the land-use plan to change the VQO of this area to a modification VQO, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Manti-La Sal LRMP could be amended to change the VQO of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

NOTE: [1]Additional information on the specific management areas crossed, and their management emphasis, is included in Appendix D.

TABLE 5-31
ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF1

Identification Number on Map 5-1b	🟩 ANF1	
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	A forest-wide standard in the 1986 Ashley National Forest Land and Resource Management Plan (LRMP) states that the forest will manage visual resource according to the adopted Visual Quality Objective 9 (VQO) (page IV-19 of LRMP). Due to proximity to the Avintaquin Campground and paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with retention VQO.	
Description of Potential Plan Amendment	The area in the Project right-of-way that is inconsistent with a retention VQO that could not be mitigated through application of selective mitigation measures (Link U513 Milepost 3.0 to 3.4) would be amended from a retention VQO to a modification VQO.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Camp Timberlane/Argyle Canyon Variation 5	Link U513 0.4 mile
Management Areas Crossed[1]	Areas 1 and 2	

Potential Environmental Effects



The following changes to the overall Ashley National Forest Visual Management System VQOs would occur through the amendment of these areas:

Camp Timberlane/Argyle Canyon Variation 5: 12 fewer acres of a retention VQO (currently 473,545 acres) and 12 more acres of a modification VQO (currently 316,949 acres)

Direct and Indirect Effects

This area is currently managed as a retention VQO, which USFS Handbook 462 describes as an area where management activities are not to be visually evident. Activities may only repeat form, line, color, and texture frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, pattern, etc., should not be evident. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 12 acres near the Avintaquin Campground were amended from a retention VQO to a modification VQO, then the VQO would be amended in accordance with the description provided in USFS Handbook 462: "Management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences in the surrounding area or character type. Additional parts of these activities such as structures, roads, slash, root wads, etc., must remain visually subordinate to the proposed composition. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow

TABLE 5-31 ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF1	
Identification Number on Map 5-1b	🟩 ANF1
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)

naturally established form, line, color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings."

Amending a portion of the VQO designation from the existing retention VQO to a modification VQO would allow changes to the characteristic landscape to increase from not being visually evident to instead management activities that may visually dominate the characteristic landscape. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

Cumulative Effects

As currently managed as a retention VQO, the Project and other reasonably foreseeable future actions (RFFA) that could be visually evident in the characteristic landscape would not be permitted in this area unless determined to meet existing objectives through application of mitigation measures.

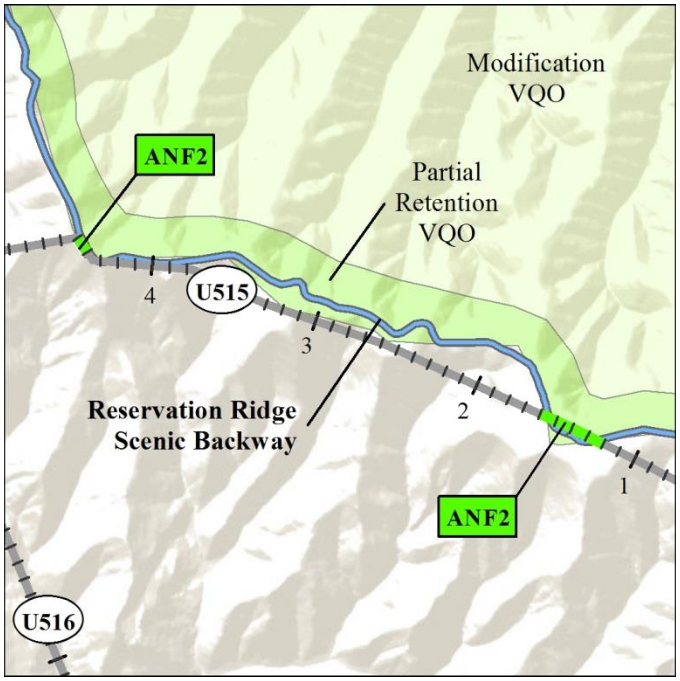
By amending the land-use plan to change the VQO of this area to a modification VQO, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Ashley LRMP could be amended to change the VQO of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

NOTE: [1] Additional information on the specific management areas crossed, and their management emphasis, is included in Appendix D.

TABLE 5-32
ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF2

Identification Number on Map 5-1b	🟩 ANF2	
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	A forest-wide standard in the 1986 Ashley National Forest Land and Resource Management Plan (LRMP) states that the forest will manage visual resource according to the adopted Visual Quality Objective 9 (VQO) (page IV-19 of LRMP). Due to paralleling the Reservation Ridge Scenic Backway, the Project would not be consistent with a partial retention VQO.	
Description of Potential Plan Amendment	The area in the Project right-of-way that is inconsistent with a partial retention VQO that could not be mitigated through application of selective mitigation measures (Link U515 Mileposts 1.2 to 1.6 and 4.4 to 4.5) would be amended from a partial retention VQO to a modification VQO.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Camp Timberlane/Argyle Canyon Variations 2 and 5	Link U515 0.5 mile
Management Areas Crossed[1]	Areas 1 and 2	

Potential Environmental Effects



The following changes to the overall Ashley National Forest Visual Management System VQOs would occur through the amendment of these area:

Camp Timberlane/Argyle Canyon Variation 2: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres)
Camp Timberlane/Argyle Canyon Variation 5: 13 fewer acres of a partial retention VQO (currently 240,485 acres) and 13 more acres of a modification VQO (currently 316,949 acres)

Direct and Indirect Effects
This area is currently managed as a partial retention VQO, which USFS Handbook 462 describes as an area where management activities remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, and texture common to the characteristic landscape, but changes in their qualities of sizes, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape. Activities also may introduce form, line, color, or texture found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape. The Project, after application of all feasible measures to reduce visual contrast, would not be able to meet the criteria of this objective and would not be permitted in this area.

If 13 acres adjacent to the Reservation Ridge Scenic Backway were amended from a partial retention VQO to a modification VQO, then the VQO would be amended in accordance with the description provided in USFS

TABLE 5-32
ASHLEY NATIONAL FOREST PLAN AMENDMENT ANF2

Identification Number on Map 5-1b	🟩 ANF2
Resource Management Plan	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)

Handbook 462: "Management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences in the surrounding area or character type. Additional parts of these activities such as structures, roads, slash, root wads, etc., must remain visually subordinate to the proposed composition. Activities which are predominately introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color, and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings."

Amending a portion of the VQO designation from the existing partial retention VQO to a modification VQO would allow changes to the characteristic landscape to increase from needing to remain visually subordinate to instead management activities that may visually dominate the characteristic landscape. The change of current planning direction would result in, but not be limited to, the allowance of the Project.

Cumulative Effects

As currently managed as a partial retention VQO, the Project and other reasonably foreseeable future actions (RFFA) that could visually dominate the characteristic landscape would not be permitted in this area unless determined to meet existing objectives through application of mitigation measures.

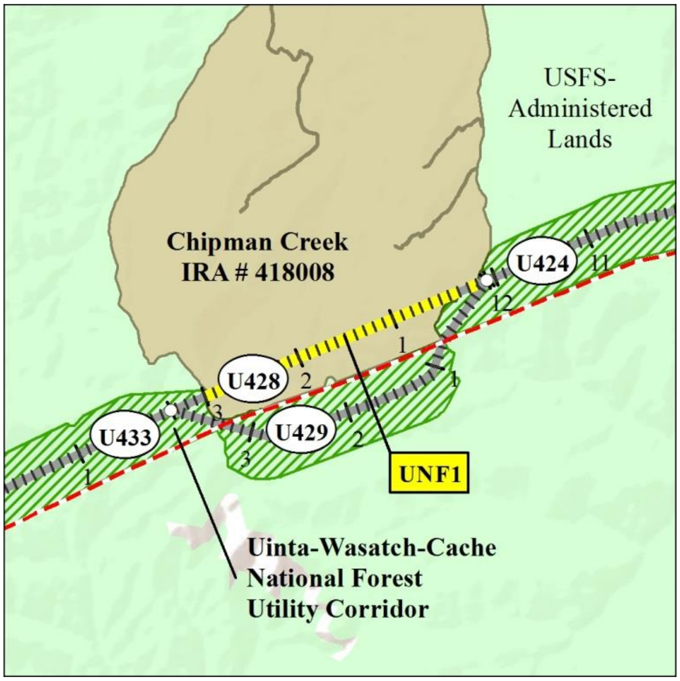
By amending the land-use plan to change the VQO of this area to a modification VQO, the Project or other RFFAs could be sited on these lands and further dominate views in this area. Furthermore, in association with other RFFAs, the Ashley LRMP could be amended to change the VQO of additional adjacent areas to accommodate those projects, such as the TransWest Express Transmission Project, which would allow for further dominance of views and impacts on scenic values.

NOTE: [1]Additional information on the specific management areas crossed, and their management emphasis, is included in Appendix D.

TABLE 5-33
UINTA NATIONAL FOREST PLAN AMENDMENT UNF1

Identification Number on Map 5-1b	🟨 UNF1	
Resource Management Plan	Uinta National Forest, Record of Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (U.S. Forest Service [USFS] 2003)	
Could Decision Require Amendment?	Yes	
Nonconformance Issue	Due to being outside of the Uinta National Forest utility corridor where the Project crosses the inventoried roadless area, the Project would not be consistent with the Uinta National Forest Land and Resource Management Plan (MP-8.2-4 Standard, page 3-49 of Land and Resource Management Plan).	
Description of Potential Plan Amendment	The area in the Project right-of-way that is inconsistent with the utility corridor limitations would be amended to include the Project right-of-way under the applicable utility corridor.	
Alternative Routes (Link[s]) Relevant to Potential Plan Amendment	Chipman Creek Variation 1	Link U428 2.8 mile
Management Areas Crossed[1]	Areas 1 and 2	

Potential Environmental Effects



Direct and Indirect Effects
The direct and indirect effects on the resources attributed to amending the plan to include the Project right-of-way as a utility corridor would be the same as the direct and indirect effects of constructing, operating, and maintaining the Project described for Chipman Creek Variation 1 in Appendix F since this amendment would allow the Project to be permitted on this route.

Cumulative Effects
Including the Project right-of-way as a utility corridor could allow additional utilities to be located in the corridor. If additional utilities are developed, such as the TransWest Express Project or other future extra-high-voltage transmission lines, they would likely result in cumulative effects on resources similar to cumulative effects from this Project discussed in Chapter 4.

Including the Project right-of-way as a utility corridor could allow increased access into an area previously closed to vehicular traffic.

Including the Project right-of-way as a utility corridor could create a siting opportunity for future projects as this area would become more dominated by transmission lines, such as the TransWest Express Project or other future extra-high-voltage transmission lines if additional exceptions were granted. The addition of these potential projects has the potential to further impact visual values from viewing locations through additional structures, vegetation management activities, and access roads in this area.

NOTE: [1] Additional information on the specific management areas crossed, and their management emphasis, is included in Appendix D.

Chapter 6

Consultation and Coordination

CHAPTER 6 – CONSULTATION AND COORDINATION

6.1 Introduction

Integrated with the planning, analysis, and review activities of EIS preparation, the BLM is conducting a comprehensive program of agency coordination and public participation, commencing with scoping early on and continuing throughout the NEPA and land-use planning process. The intent of the program is to proactively encourage interaction between the BLM and other federal and state agencies, local governments, American Indian tribes, and the public to keep them informed about the Project through dissemination of information and to solicit information that assists in analysis and decision-making.

Throughout the preparation of this document, formal and informal efforts have been implemented by the BLM to involve, consult, and coordinate with other federal and state agencies and local governments, American Indian tribes, and the public. Such communication is important (1) to ensure the most appropriate data have been gathered and employed for analysis and (2) to ensure agency policy and public sentiment and values are considered and incorporated into decision-making.

This chapter provides a brief description of the methods employed for communication and interaction, which includes consultation and coordination with agencies, tribes, and stakeholders; the scoping process; Applicant-initiated activities; and public review of the Draft EIS and LUPAs.

6.1.1 Summary of Changes from the Draft Environmental Impact Statement

Substantive changes made between the Draft and Final EIS are demarcated on the left margin of the chapter by a vertical black line.

6.1.2 Consultation and Coordination

Agencies and organizations having jurisdiction and/or specific interest in the Project were contacted at the beginning of scoping, during the resource inventory, and prior to the publication of the EIS to inform them of the Project, verify the status and availability of existing environmental data, request data and comments regarding environmental concerns and issues, and solicit their input about the Project. Additional contacts were made throughout the process to clarify information and/or update data. All conversations with agency personnel have been documented, distributed to the appropriate Project personnel, and are maintained in the Project administrative record. Specific concerns and recommendations have been discussed and documented for further action. This section describes the consultation and coordination activities that have taken place throughout the NEPA and land-use planning process.

6.2 Early Agency Coordination

As mentioned previously, the Applicant submitted the original application for right-of-way across federal land on November 28, 2007. Most of the federal land crossed by the alternative routes is administered by the BLM; therefore, the BLM was designated the lead agency responsible for preparing the EIS and LUPAs and other documentation in compliance with federal laws, regulations, or policies.

The following year, the Applicant revised the description of the Project and preliminary alternative routes, and submitted to the BLM a revised right-of-way application on December 17, 2008. In early 2009, the BLM Project Manager arranged meetings in February and March with each of the BLM district and field offices as well as the national forests that could be affected by the Project. The purpose of these meetings was to introduce the Project; discuss the process and schedule for preparing the EIS and other environmental documentation; discuss the preliminary alternative routes to be analyzed; and to discuss potential resource conflicts, potential issues, and data needs.

Follow-up working sessions were conducted early in and ongoing throughout the NEPA process to discuss the preliminary alternative routes and potential issues in more detail. These working sessions are listed in Table 6-1.

TABLE 6-1
LIST OF AGENCY WORK SESSIONS

Date	Agencies	
June 2009	▪ Bureau of Land Management (BLM) Wyoming State Office ▪ BLM Little Snake Field Office	▪ Colorado State Land Board ▪ Colorado Division of Wildlife, Moffat County
September 2009	▪ BLM Wyoming State Office ▪ BLM Price Field Office	▪ Rocky Mountain Power ▪ TransWest Express, LLC
April 2010	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ U.S. Forest Service	▪ U.S. Army Corps of Engineers ▪ Utah Public Lands Policy Coordination Office ▪ Rocky Mountain Power
July 2010	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ BLM Little Snake Field Office ▪ Wyoming Governor's Office ▪ U.S. Fish and Wildlife Service	▪ Wyoming Game and Fish Department ▪ Carbon County ▪ Little Snake River Conservation District ▪ Saratoga-Encampment-Rawlins Conservation District ▪ Rocky Mountain Power
October 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office	▪ Emery County
December 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office	▪ Emery County
July 2012	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ BLM Richfield Field Office ▪ BLM Vernal Field Office ▪ Ashley National Forest ▪ Dixie National Forest	▪ Manti – La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Utah Division of Wildlife Resources ▪ Carbon County ▪ Sanpete County ▪ Duchesne County
August 2012	▪ BLM Wyoming State Office ▪ Dixie National Forest	▪ Uinta-Wasatch-Cache National Forest
November 2012	▪ BLM Wyoming State Office ▪ Utah Reclamation Mitigation and Conservation Commission	▪ U.S. Bureau of Reclamation ▪ Central Utah Water Conservation District
December 2012	▪ BLM Wyoming State Office ▪ BLM Northwest District Office ▪ BLM Little Snake Field Office	▪ National Park Service ▪ Colorado Parks and Wildlife
June 2013	▪ BLM Wyoming State Office	▪ BLM Rawlins Field Office
December 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office	▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team

6.2.1 Cooperating Agencies

In late May and June 2009, the BLM sent formal letters inviting all agencies and tribes whose jurisdiction and/or expertise are relevant to the Project to participate as cooperating agencies in the preparation of the EIS and LUPAs. The BLM conducted conference calls on January 14 and 21, 2010, to orient the participating agency personnel to the Project and to discuss their roles and responsibilities on the Project, The agencies that accepted the invitation to participate as cooperating agencies are listed below.

Federal

- Department of Agriculture
    - Forest Service, Intermountain Region
- Department of Defense
    - Army Corps of Engineers, South Pacific Division
    - Army Environmental Center
    - Navy Region Southwest
- Department of the Interior
    - Bureau of Indian Affairs, Western Region
    - Fish and Wildlife Service, Mountain-Prairie Region
    - National Park Service
- Utah Reclamation Mitigation and Conservation Commission

States

- Wyoming
- Utah
- Colorado

Counties

- Wyoming
    - Carbon County
    - Sweetwater County
- Colorado
    - Mesa County
    - Moffat County
    - Rio Blanco County
- Utah
    - Carbon County
    - Duchesne County
    - Emery County
    - Grand County
    - Juab County
    - Sanpete County
    - Uintah County
    - Wasatch County

Wyoming Conservation Districts

- Little Snake River
- Medicine Bow

- Saratoga-Encampment-Rawlins
- Sweetwater County

Conference calls of the Agency Interdisciplinary Team, including the cooperating agencies, have been conducted once or twice each month to discuss the status of the Project and to exchange information. In addition, to date, four in-person meetings have been held at key milestones in the NEPA and land-use planning process. The four meetings held and the purpose of each meeting is as follows:

- **September 13, 14, and 16, 2011.** BLM reviewed Project management and administrative protocols, schedule, scoping activities and results, and alternative routes being carried forward for further analysis and discussed potential plan amendments and resource data collection and inventories. A meeting was held in each of the three states—Wyoming, Colorado, and Utah.
- **December 13, 2011.** BLM reviewed the status of the alternative routes and resource data collection, and reviewed the approach for assessing impacts, planning measures to mitigate impacts, and screening and comparing the alternative routes. The meeting was conducted by webcast.
- **August 20, 22, and 23, 2012.** BLM reviewed resource inventory data, discussed resources issues, and discussed the approach for impact assessment and mitigation planning. A meeting was held in each of the three states.
- **February 5, 6, and 7, 2013.** BLM reviewed the first administrative Draft EIS, discussed comments from the agencies, and initiated discussions to identify an Agency Preferred Alternative. A meeting was held in each of the three states.

Coordination with the Agency Interdisciplinary Team will continue through the completion of the EIS, LUPAs, and POD.

6.2.2 Consultation

The BLM is required to prepare EISs in coordination with any studies or analyses required by the Fish and Wildlife Conservation Act (16 U.S.C. 661 et seq.), ESA (16 U.S.C. 1531 et seq.), and the NHPA, as amended (54 U.S.C. 300101 et seq.). Also, in accordance with Executive Order 13175, BLM must consult, government to government, with American Indians to ensure the tribes are informed about actions that may affect them.

6.2.2.1 Biological Resources

Under the provisions of Section 7(a)(2) of the ESA, a federal agency that carries out, permits, licenses, funds, or otherwise authorizes an activity must consult with the FWS as appropriate to ensure the action is not likely to jeopardize the continued existence of any species listed under the ESA or result in the destruction or adverse modification of designated critical habitat. Informal consultation for the Project began with the submittal of written correspondence to the FWS from the BLM on July 23, 27, and 30, 2009. At the direction of the FWS, the BLM obtained lists of federally threatened, endangered, and candidate species with the potential to occur in the Project area from the FWS. The species lists have been updated as new lists become available to reflect the current listing status of all federally listed, proposed, and candidate species occurring in and potentially affected by the Project.

Informal consultation among the BLM and cooperating agencies, including the FWS has continued throughout the development of the EIS including meetings, conference calls, letters, and other correspondence. In early 2010, the BLM established the BRTG composed of the biologists from the

BLM, USFS, FWS, and the state wildlife agencies. The group meets via conference call once a month to discuss the status of the Project, issues, and approach to addressing key biological resource issues.

In early 2011, the FWS, BLM, USFS, BIA, and USACE (federal agencies with the authority and responsibility to perform certain actions associated with the Project) entered into a Consultation Agreement. Additional federal agencies signed the Agreement in 2013 (i.e., URMCC, NPS). The Agreement addresses interagency coordination for the affirmative conservation and recovery of listed species under Section 7(a)(1) of the ESA. Section 7(a)(1) directs all federal agencies to use their authorities in furtherance of the purposes of the ESA by "carrying out programs for the conservation and recovery of listed species." Pursuant to Section 7 (a)(1), the Agreement clarifies agency roles during consultation under Section 7(a)(2) for the direct, indirect, and cumulative effects of the Proposed Action on listed species, species proposed for listing, and their associated designated or proposed critical habitat. In coordination with appropriate state natural-resource management agencies that have trust authority for nonlisted species, the Agreement also speaks to interagency coordination for the conservation of, and assessment of effects on, candidate species that may be affected by the Proposed Action.

Pursuant to Section 7(c)(1) of the ESA, the BLM, in cooperation with the appropriate cooperating agencies, prepared a Biological Assessment to initiate formal consultation with the FWS and fulfill agency obligations under Section 7(a)(2) of the Act for the Agency Preferred Alternative route. A draft Biological Assessment was prepared in coordination with the BRTG and provided to FWS and cooperating agencies for a courtesy review in early January 2015. The draft Biological Assessment was updated based on agency comments and coordination from February to May 2015. The final Biological Assessment was submitted to FWS in July 2015 and is available on the BLM website for the Project. The BLM worked collaboratively with the FWS to ensure that the FWS had an appropriate amount of time to review the information contained in the Biological Assessment and prepare a Biological Opinion prior to completion of a ROD or irreversible or irretrievable commitment of resources by any agency. The Biological Opinion will be included with BLM's Record of Decision. Additionally, the Applicant has convened a group of sage-grouse biologists from the BLM and cooperating agencies (the Habitat Equivalency Analysis [HEA] Technical Working Group) to provide input and guidance during the development of the Applicant's Sage-grouse Mitigation Plan, including the HEA component of the mitigation plan. The agency biologists work closely with the Applicant to ensure adequacy of the mitigation analysis and corresponding final product, as well as addressing concerns and questions, developing assumptions for the analysis, and resolving issues as they arise. The HEA Technical Working Group meets as-needed during development of the Sage-grouse Mitigation Plan and HEA.

The *Conservation Plan for Greater Sage-grouse in Utah* was approved by the governor of Utah in 2013. The plan establishes incentive-based conservation programs for conservation of sage-grouse on private, local government, and SITLA land and regulatory programs on other state and federally managed lands. The conservation plan also establishes sage-grouse management areas and implements specific management protocols in these areas. The BLM has coordinated with the state regarding the consistency of the Project with the management provisions for transmission corridors included in the *Conservation Plan for Greater Sage-grouse in Utah*. BLM will continue to coordinate with the state regarding consistency of the Applicant's Sage-grouse Mitigation Plan with additional mitigation that may be required in the *Conservation Plan for Greater Sage-grouse in Utah.*

6.2.2.2 Cultural Resources

Section 106 (54 U.S.C. 306108) of the NHPA requires federal agencies to take into account the effects of actions on historic properties (cultural resources that are either eligible for or listed in the NRHP). Regulations for the implementation of Section 106 are defined in 36 CFR Part 800 – Protection of Historic Properties. These regulations define how federal agencies meet their statutory responsibilities as required under the law. The Section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties (36 CFR 800.1). These parties include the ACHP, SHPOs, American Indian tribes, Tribal Historic Preservation Officers, state and other federal agencies, and individuals or organizations with a demonstrated interest in the undertaking due to their legal or economic relation to the undertaking or affected properties, or their concern with the effects of undertakings on historic properties (36 CFR 800.2).

As lead federal agency for compliance with Section 106 of the NHPA, the BLM initiated Section 106 consultation with the SHPOs, PLPCO, SITLA, USFS, NPS, and ACHP pursuant to 36 CFR Part 800.6 and 800.14 (b) of the ACHP's regulations implementing Section 106 of the NHPA in April 2010. The Section 106 process is separate from, but often conducted parallel with, the preparation of an EIS. To ensure compliance with Section 106, in 2010 the BLM assembled a formal group, the CRTG, composed of the BLM State Archaeologists from each of the three states and cultural resources specialists from USFS, BIA, NPS, and Utah PLPCO. The CRTG convenes at least once a month. Other agency cultural resources personnel may participate as consultation progresses. Consultation under Section 106 of the NHPA is ongoing and will continue during post-EIS phases of Project implementation.

The BLM in consultation with the Wyoming, Colorado, and Utah SHPOs agreed to develop a Programmatic Agreement among the various state and federal agencies and consulting parties with an interest in the Project. A Programmatic Agreement outlines the stipulations that will be followed concerning the identification, assessment, and treatment of cultural resources for the Project in accordance with 36 CFR 800.15(b). Signatories agree that the Project will be administered in accordance with stipulations and measures set forth in the Programmatic Agreement. To date, the signatory parties include the BLM, USFS, NPS, Bureau of Reclamation, U.S. Army Corps of Engineers, BIA, and three SHPOs. The ACHP declined to participate. Invited parties include the Applicant, the Ute Indian Tribe, SITLA, UDOT, and the Utah Reclamation Mitigation and Conservation Commission. Concurring parties include the following:

- Alliance for Historic Wyoming
- Mesa County, Colorado
- Milford Archaeological Research Institute
- Moffat County, Colorado
- National Trust for Historic Preservation
- Old Spanish Trail Association
- Oregon-California Trails Association
- Overland Trail Cattle Company
- Tracks Across Wyoming
- Utah Public Lands Policy Coordination Office
- Utah Professional Archaeological Council
- Utah Rock Art Research Association
- Utah Statewide Archaeology Society
- Confederated Tribes of the Goshute Reservation
- Eastern Shoshone Tribe of the Wind River Reservation
- Hopi Tribe
- Jicarilla Apache Tribe
- Navajo Nation
- Northern Arapaho Tribe of the Wind River Reservation
- Northwestern Band of Shoshone Nation
- Paiute Indian Tribe of Utah
- Pueblo of Acoma

- Pueblo of Cochiti
- Pueblo of Isleta
- Pueblo of Jemez
- Pueblo of Laguna
- Pueblo of Nambe
- Pueblo of Picuris
- Pueblo of Pojoaque
- Pueblo of San Felipe
- Pueblo of San Ildefonso
- Pueblo of San Juan
- Pueblo of Sandia
- Pueblo of Santa Ana
- Pueblo of Santa Clara
- Pueblo of Santo Domingo
- Pueblo of Taos
- Pueblo of Tesuque
- Pueblo of Zia
- Pueblo of Zuni
- San Juan Southern Paiute Tribe
- Shoshone-Bannock Tribes of the Fort Hall Reservation
- Skull Valley Band of Goshute Indians of Utah
- Southern Ute Indian Tribe of the Southern Ute Reservation
- Ute Mountain Ute Tribe of the Ute Mountain Reservation.

Through the development of a Programmatic Agreement, the BLM and cooperating agencies have outlined a phased approach to fulfill the four requirements of Section 106: initiate consultation, identify historic properties, assess adverse effects, and resolve adverse effects. The first step (initiate consultation) requires the BLM to establish the undertaking, identify the appropriate SHPO(s) or Tribal Historic Preservation Office, plan to involve the public, and identify other consulting parties. This step is generally scheduled concurrently with the NEPA scoping efforts. The second step (identify historic properties) requires BLM to determine the scope of the efforts (e.g., the methodologies for each type of cultural resource study, the Project APEs for each study), identify historic properties (Class III intensive pedestrian inventories), and evaluate historic significance (i.e., apply the four NRHP criteria). During the third step, BLM assesses adverse effects on historic properties identified during the previous step. The second and third steps parallel the NEPA processes of drafting the EIS, conducting public hearings/workshops, and finalizing the EIS. The final step in the Section 106 process is the resolution of adverse effects, which will be documented in the HPTP. A final draft of the Programmatic Agreement is provided in Appendix N. Letters concerning the Programmatic Agreement were sent on April 18, 2014, and June 12, 2015, to all of the tribes listed above. Table 6-2 indicates the tribes that have responded.

TABLE 6-2
RESPONSES OF TRIBES TO LETTERS CONCERNING THE PROGRAMMATIC AGREEMENT

Tribe	Date of Response	Response
Hopi Tribe	May 6, 2014	The tribe supports the identification and avoidance of their ancestral sites and considers prehistoric archaeological sites of their ancestors to be traditional cultural properties.
Hopi Tribe	July 6, 2015	Deferred to the State Historic Preservation Offices and other interested tribes. Interested in ongoing consultation.
Pueblo of San Felipe	July 15, 2015	Asked if there is going to be any meetings held with the Tribal Historic Preservation Offices regarding this Project and asked if any comments have been received.

The Programmatic Agreement will be complete prior to issuance of the ROD; however, stipulations may need to be included in the right-of-way grant requiring completion of agency-approved treatment of historic properties identified by agency archaeologists as needing further investigation before any Project-related ground-disturbing activities commence in the vicinity of the historic properties. If stipulations are included in the right-of-way grant, the Authorized Officer would issue a Notice to Proceed upon satisfactory completion of each investigation.

Government-to-Government and Section 106 Tribal Consultation

The U.S. has a unique legal relationship with American Indian tribal governments as set forth in the Constitution of the U.S., treaties, Executive Orders (e.g., Executive Order 13175), federal statutes, federal policy, and tribal requirements, which establish the interaction that must take place between federal and tribal governments. An important basis for this relationship is the trust responsibility of the U.S. to protect tribal sovereignty, self-determination, tribal lands, tribal assets and resources, and treaty and other federally recognized and reserved rights. Government-to-Government consultation is the process of seeking, discussing, and considering views on policy, and/or, in the case of this Project, environmental and cultural resource management issues. As part of the BLM's and cooperating agencies' (including USFS, BIA,USACE, NPS) on-going Government-to-Government consultation, tribal officials were informed of the Project and those who expressed interest in the Project will be updated periodically on the status of the Project through the completion of the NEPA process. For efficiency, Government-to-Government consultation activities often are combined with Section 106 tribal consultation activities. The BIA, a fiduciary for the administration and management of surface land and subsurface minerals estate held in trust by the U.S. for American Indian tribes and individual Indians, is a cooperating agency involved in the preparation of the EIS and would authorize, with the approving consent of the Ute Indian Tribe, any rights-of-way over lands held in trust from the Ute Indian Tribe of the Uintah and Ouray Indian Reservation.

Pursuant to 36 CFR Part 800.2, the lead federal agency must consult with American Indian tribes that attach religious and cultural significance to historic properties that may be affected by an undertaking. This requirement applies regardless of the location of the historic property. In such cases, the federal agency must notify American Indian tribes potentially affected by the undertaking and give those American Indian tribes the opportunity to participate in the Project as a concurring party should they wish to do so.

Federal legislation applicable to tribal consultation in the Project area includes:

- NHPA (54 U.S.C. 300101 et seq; 36 CFR Part 800), specifically Section 106 (54 U.S.C. 306108) , directs federal agencies to take into account the effects of their actions on historic properties and provide the tribes a reasonable opportunity to comment.
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa to 470ee) authorizes federal land-management agencies to manage through a permit process the excavation and/or removal of archaeological resources on federal lands. The land-management agencies must consult with American Indian tribes with interests in resources prior to issuance of permits.
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996) requires federal lead agencies and/or federal land-management agencies to consult with affected American Indian tribes regarding federal actions that would pose potential conflicts with freedom to practice traditional American Indian religions.
- NAGPRA (25 U.S.C. 3001-3002) provides a process through which federal agencies consult with affected Native Americans regarding the treatment and return of human remains, funerary

objects, sacred objects, and items of cultural patrimony identified on federal lands as a result of a federal action.

- Executive Order 13007, issued in 1996, directs federal land-management agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of sacred sites. Where appropriate, agencies will maintain the confidentiality of these sites.
- Executive Order 13175, issued in 2000, charges each federal agency to engage in timely and meaningful consultation and collaboration with Indian tribal governments, strengthen the government-to-government relationship between the U.S. and Indian tribes, and reduce the imposition of unfunded mandates upon Indian tribes.
- Government-to-Government Relations with Native American Tribal Governments Memorandum (signed by President Clinton, April 29, 1994), 59 FR 22951 (May 4, 1994) directs federal agencies to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments prior to taking actions that affect federally recognized tribal governments. Federal agencies must assess the impact of federal government plans, projects, programs, and activities on tribal trust resources and ensure that tribal government rights and concerns are considered during such development.
- Religious Freedom Restoration Act of 1993 [42 U.S.C. 2000bb – 2000bb-4] prohibits federal agencies from substantially burdening any person’s exercise of religion even if the burden results from a rule of general applicability, except if the federal agencies demonstrate that application of the burden to the person is in furtherance of a compelling interest; and is the least restrictive means of furthering that compelling governmental interest.
- Secretarial Order 3206, issued in 1997 by the Secretary of the Interior and the Secretary of Commerce pursuant to the ESA (16 U.S.C. 1531, as amended), the federal-tribal (i.e., government-to-government) trust relationship, and other federal law. The order directs component agencies of the USDI and the Department of Commerce to carry out their responsibilities under the ESA in a manner that harmonizes the federal trust responsibility to tribes, tribal sovereignty, and statutory missions of the departments, and that strives to ensure the Indian tribes do not bear a disproportionate burden for the conservation of listed species.
- USDI Policy on Consultation with Indian Tribes, outlines the USDI’s consultation framework for fulfilling its tribal consultation obligations, including requirements for government-to-government consultation between tribal officials and department officials.

BLM IM No. 2010-037: Tribal Consultation and Cultural Resource Authorities provides an update on the BLM’s tribal outreach initiative, emphasizes the importance of tribal relations and partnerships for the BLM, and discusses revision of the national Programmatic Agreement that the BLM maintains with the ACHP and National Conference of SHPOs. In addition, the SHPO for each state involved (Wyoming, Colorado, and Utah) is responsible for ensuring that laws applicable to tribal consultation are followed on lands under the jurisdiction of the state.

State of Wyoming statutes and guidelines include the following:

- At present, Wyoming has no state statutes pertaining to tribal consultations and/or the handling of inadvertently discovered human Native American remains.

State of Colorado statutes and guidelines include the following:

- Unmarked Human Graves. Discovery of human remains (C.R.S. 24-80-1302) requires examination of inadvertently discovered human remains within 48 hours of notification to determine if the remains are of forensic value. If the coroner determines the remains are of no forensic value, then the coroner notifies the State Archaeologist, who makes an examination as soon as possible to determine if the remains are more than 100 years old and if they are Native American. If the remains are determined to be Native American, the State Archaeologist notifies the Secretary of the Colorado Commission of Indian Affairs, who in turn notifies interested tribes in the region, via email or mail (by their choice) before removal.

- *Process for Consultation, Transfer and Reburial of Culturally Unidentifiable Native American Human Remains and Associated Funerary Objects Originating From Inadvertent Discoveries on Colorado State and Private Lands* is an agreement between the Colorado Commission of Indian Affairs and the Colorado Historical Society that establishes a process for the consultation, repatriation, and reburial of culturally unidentifiable Native American human remains and associated funerary objects inadvertently discovered on private and state lands in Colorado.

State of Utah statutes and guidelines include the following:

- UAC Section 9-9-403 provides a process for the ownership and disposition of Native American human remains discovered on nonfederal lands not state owned.
- UAC Section 76-9-704 provides the definitions and penalties for the abuse or desecration of a dead human body.
- UAC Section R212-4 requires that, if human remains are discovered in conjunction with a project subject to Section 106, the project proponent is responsible for all efforts associated with the excavation, analysis, curation, or repatriation of the human remains and for notifying the Utah SHPO.
- UAC Section 9-8-309 provides a process through which landowners or land-management agencies consult with the state regarding the treatment of human remains discovered on nonfederal lands not state owned.

Early in the NEPA process, the BLM in coordination with the federal and state cooperating agencies, identified 33 American Indian tribes that may have a traditional association with the Project area. The BLM initiated contact with American Indian tribes in accordance with various environmental laws and Executive Orders[1]. As part of scoping, the BLM mailed letters, dated April 2011, to the American Indian tribes listed in Table 6-3 that may have an interest in the Project area to inform them of and determine their interest in the Project.

The BLM received responses from four tribes. The Hopi Tribe responded in April 2011 that the tribe would participate in Government-to-Government consultation. The Pueblo of Laguna responded in April 2011 that the tribe had no objections to the Project at that time. The Ute Mountain Ute Tribe of the Ute Mountain Ute Reservation informed the BLM in May 2011 that they intend to consult on the Project. In July 2011, the Eastern Shoshone Tribe of the Wind River Reservation informed the BLM that they intend to consult on the Project. The BLM received no responses from the other 29 tribes.

In March 2012, the same 33 tribes were invited to participate in development of the Project Programmatic Agreement under Section 106 of the NHPA and to sign as concurring parties. In April 2012, the tribes were invited to attend a meeting with Consulting Parties conducted by the BLM. The purpose of the meeting was for the BLM to (1) introduce the Project; (2) provide an overview of Section 106 of the

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[1] NEPA; NHPA, as amended; American Indian Religious Freedom Act of 1978; NAGPRA, as amended; FLPMA, Archaeological Resources Protection Act of 1979; Executive Order 11593 – Protection and Enhancement of the Cultural Environment; Executive Order 12898 – Environmental Justice; Executive Order 13007 – Indian Sacred Sites; Executive Order 13175 – Consultation and Coordination with Indian tribal Governments

NHPA; (3) discuss the purpose, use, and development of a Programmatic Agreement for the Project; (4) explain the Project schedule; and (5) provide those interested in an opportunity to affirm their level of interest in the Project. The BLM received responses from four tribes in March 2012. The Hopi Tribe, Eastern Shoshone Tribe of the Wind River Reservation, and Pueblo of Santa Clara all responded that the they intend to participate in the Section 106 process for the Project. The Confederated Tribes of the Goshute Indian Reservations informed the BLM that the tribe defers their Section 106 consultation to the Ute Indian Tribe of the Uintah and Ouray Indian Reservation. The BLM received no responses from the other 29 tribes.

In April 2012, the BLM mailed Project information materials for the April 2012 Section 106 Consulting Parties meeting to nine tribes (Eastern Shoshone Tribe of the Wind River Reservation, Hopi Tribe, Northern Arapaho Tribe of the Wind River Reservation, Paiute Indian Tribe of Utah, Pueblo of Santa Clara, Pueblo of Taos, Southern Ute Indian Tribe of the Southern Ute Reservation, Ute Mountain Ute Tribe of the Ute Mountain Ute Reservation, and Ute Tribe of the Uintah and Ouray Reservation) based on the proximity of traditional tribal territories to the Project area or confirmation from the tribe that they intend to participate with the BLM in Section 106 consultation. The Hopi Tribe responded, informing the BLM that the tribe did not intend to participate in the meeting. The remaining eight tribes did not respond to the mailing.

On April 23, 2012, the BLM and Applicant met with representatives of the Ute Tribe Energy & Minerals Department, Uintah and Ouray Indian Reservation. The purpose of the meeting was to introduce and discuss the Project. Also, the BLM was invited to give a presentation to the TriUte Association on May 31, 2012, to introduce and discuss the Project. The BLM and Ute Tribe agreed to continue coordination.

In April 2013, a letter was sent to the Ute Tribe Energy & Minerals Department providing a status update on the Project and a request for the Ute Tribe to participate as a cooperating agency. A cooperating agency draft MOU was attached to the letter for review and consideration. In addition, a request was made to assist in scheduling a meeting with the Energy & Minerals Department or a meeting with the Business Committee to discuss the Project. No response was received.

In May 2013, the BLM sent email messages to the Director, Ute Tribe Cultural Rights and Protection, regarding scheduling a meeting to discuss NHPA Section 106 consultation and the draft Programmatic Agreement. No response was received. In July 2013, another email message was sent to the Director to invite the Ute Tribe’s participation in a Consulting Parties meeting on July 30, 2013, in Price, Utah, to review and discuss the Section 106 draft Programmatic Agreement. Attached to the email was the draft Programmatic Agreement for review and comment. No response was received, nor was the tribe represented at the meeting.

In August 2013, a letter was sent to the Ute Tribal Chairman and Council providing a status update on the Project and a request for the Ute Tribe to participate as a cooperating agency. A cooperating agency draft MOU was attached to the letter for review and consideration. In addition, a request was made to assist in scheduling a meeting with the Tribal Council, Business Committee, or both to discuss the Project. No response was received.

In January 2014, the BLM sent another letter to the Ute Tribal Chairman, with copies to the Tribal Council and heads of the tribal departments, to inform them of the upcoming availability of the Draft EIS (February 2014) and to request a meeting with the Tribal Council and/or Business Committee. A chronology of BLM’s outreach to the Ute Tribe was included with the letter. No response was received.

In May 2014, the BLM sent a letter to 24 tribes regarding scheduling an in-person meeting in Salt Lake City, Utah, to review and discuss the modification of the draft Programmatic Agreement. The American

Indian tribes were informed that the NEPA scoping efforts have occurred and the Draft EIS was published on February 21, 2014. In addition, it was mentioned the Programmatic Agreement will be included in the Final EIS. Attached to the letter was the draft Programmatic Agreement for review and comment, along with a comment form to use. The American Indian tribes invited to attend the meeting were the Eastern Shoshone Tribe of the Wind River Reservation, Hopi Tribe of Arizona, Jicarilla Apache Nation, Navajo Nation, Northern Arapaho Tribe of the Wind River Reservation, Northwest Band of Shoshone Nation, Paiute Indian Tribe of Utah, Pueblo of Acoma, Pueblo of Cochiti, Pueblo of Isleta, Pueblo of Jemez, Pueblo of Nambe, Pueblo of Picuris, Pueblo of Pojoaque, Pueblo of San Felipe, Pueblo of San Ildefonso, Pueblo of Santa Ana, Pueblo of Zuni, Ohkay Owingeh (formerly Pueblo of San Juan), San Juan Southern Paiute Tribe, Skull Valley Band of Goshute Indians of Utah, Southern Ute Indian Tribe of the Southern Ute Reservation, Ute Mountain Ute Tribe of the Ute Mountain Ute Reservation, and Ute Tribe of the Uintah and Ouray Reservation. No response was received.

In June 2014, the BLM sent a letter to the Acting Superintendent of the BIA for the Uintah and Ouray Agency at Fort Duchesne, Utah, with copies to the Tribal Council and heads of the tribal departments, to provide a Project update. A summarized chronology of BLM's outreach throughout Wyoming, Colorado, and Utah to receive comments on the Draft EIS was included with the letter. Attached to the letter was a map showing the Agency Preferred Alternative and the other alternative routes analyzed in the Draft EIS, released for a 90-day public review period on February 21, 2014. In addition, a request was made to assist in scheduling a meeting with the Tribal Council and Business Committee to provide a project update and to further Government-to-Government consultation responsibilities. No response was received.

In April 2015, the BLM Wyoming Acting State Director sent a letter to the newly appointed Superintendent for the Uintah and Ouray Agency at Fort Duchesne, Utah, with copies to the Tribal Council members and Director, Ute Tribe Energy & Minerals Department. Attached to the letter was a map showing the Agency Preferred Alternative route and other alternative routes. A request was made to assist in scheduling a meeting with the Ute Tribe Business Committee to continue Government-to-Government consultation on the Project.

On May 20, 2015, the BLM National Transmission Support Team Archaeologist met with the Director of Cultural Rights and Protection Office of the Ute Indian Tribe to provide an update on this and other projects in the area.

In July 2015, the BLM Wyoming Acting State Director sent a letter to the newly elected Chairperson of the Ute Indian Tribe with copies to the Director of the Energy& Minerals Department and BIA Superintendent of the Uintah and Ouray Agency providing an update of Project activities and requesting a meeting with the Ute Tribe Business Committee. A response has not been received.

Results of the consultation efforts to date are summarized in Table 6-3. Specific detailed records of conversations and documentation of other communications are documented in the Project administrative record. The current status of tribal participation is summarized below.

- Thirty-three American Indian tribes have been contacted.
- Four American Indian tribes (Eastern Shoshone Tribe of the Wind River Reservation, Hopi Tribe, Pueblo of Santa Clara, and Ute Mountain Ute Tribe of the Ute Mountain Ute Reservation) have requested consultations.
- One American Indian tribe, the Confederate Tribes of the Goshute Indian Reservations, has deferred to the Ute Indian Tribe of the Uintah and Ouray Reservation to represent their interests and concerns regarding the Project during consultation with the BLM.

TABLE 6-3
TRIBAL CONTACTS AND CONSULTATION

Tribe	Type of Contact				Response
	Letters			Meetings	
	April 1, 2011[1]	March 2/ April 4, 2012[2]	May 30, 2014[3]		
Confederate Tribes of the Goshute Indian Reservations	✓	✓			In an email message on March 9, 2012, the tribe deferred to the Ute Indian Tribe of the Uintah and Ouray Reservation to represent their interests and concerns regarding the Project during consultation with the Bureau of Land Management (BLM).
Eastern Shoshone Tribe of the Wind River Reservation	✓	✓	✓		In a letter dated July 5, 2011, the tribe responded to the April 1 letter indicating they intend to participate in government-to-government consultation for the Project.
Hopi Tribe	✓	✓	✓		In a letter dated March 20, 2012, the tribe responded to the March 2 letter that they intend to participate in consultation under Section 106 of the National Historic Preservation Act. In a letter dated April 25, 2011, the tribe responded they intend to participate in government-to-government consultation for the Project. In a letter dated May 6, 2014, the tribe responded to the April 18, 2014 letter regarding the Programmatic Agreement. They claim cultural affiliation to known cultural groups in the southwestern United States. In addition, the tribe indicated the Hopi Cultural Preservation Office supports the identification and avoidance of their ancestral sites and consider prehistoric sites to be traditional cultural properties. Regarding

TABLE 6-3
TRIBAL CONTACTS AND CONSULTATION

	Type of Contact				
	Letters				
Tribe	April 1, 2011[1]	March 2/ April 4, 2012[2]	May 30, 2014[3]	Meetings	Response
					the Programmatic Agreement, the tribe deferred to the State Historic Preservation Offices and other interested tribes but stated they are interested in ongoing consultation for the Project (including Class I and III cultural resources inventories and ethnographic studies).
Jicarilla Apache Tribe	✓	✓	✓		No response
Navajo Nation	✓	✓	✓		No response
Northern Arapaho Tribe of the Wind River Reservation	✓	✓	✓		No response
Northwestern Band of the Shoshone Nation	✓	✓	✓		No response
Ohkay Owingeh (formerly Pueblo of San Juan)	✓	✓	✓		No response
Paiute Indian Tribe of Utah	✓	✓	✓		No response
Pueblo of Acoma	✓	✓	✓		No response
Pueblo of Cochiti	✓	✓	✓		No response
Pueblo of Isleta	✓	✓	✓		No response
Pueblo of Jemez	✓	✓	✓		No response
Pueblo of Laguna	✓	✓			In a letter dated April 12, 2011, the tribe responded to the April 1, 2011, letter that they had no objection to the Project at that time.
Pueblo of Nambe	✓	✓	✓		No response
Pueblo of Picuris	✓	✓	✓		No response
Pueblo of Pojoaque	✓	✓	✓		No response
Pueblo of San Felipe	✓	✓	✓		In an email dated July 15, 2015, the Director of the Department of Natural Resources of the Pueblo of San Felipe

TABLE 6-3
TRIBAL CONTACTS AND CONSULTATION

Tribe	Type of Contact				Response
	Letters			Meetings	
	April 1, 2011[1]	March 2/ April 4, 2012[2]	May 30, 2014[3]		
					enquired about the Project to which the BLM responded with a Project update on July 15, 2015.
Pueblo of San Ildefonso	✓	✓	✓		No response
Pueblo of Sandia	✓	✓			No response
Pueblo of Santa Ana	✓	✓	✓		In a letter dated June 17, 2014, the tribe sent an email to the BLM stating they have no connections to the areas involved on the Project and wished to receive no further communications.
Pueblo of Santa Clara	✓	✓			In a letter dated March 28, 2012, the tribe responded to the March 2 letter that they intend to participate in consultation under Section 106 of the National Historic Preservation Act.
Pueblo of Santo Domingo	✓	✓			No response
Pueblo of Taos	✓	✓			No response
Pueblo of Tesuque	✓	✓			No response
Pueblo of Zia	✓	✓			No response
Pueblo of Zuni	✓	✓	✓		No response
San Juan Southern Paiute Tribe	✓	✓	✓		No response
Shoshone-Bannock Tribes of the Fort Hall Reservation	✓	✓			No response
Skull Valley Band of Goshute Indians of Utah	✓	✓	✓		No response
Southern Ute Indian Tribes of Southern Ute Reservation	✓	✓	✓		No response
TriUte Association				May 31, 2012	The BLM was invited by the TriUte Association (i.e., Southern Ute Indian Tribes of Southern Ute Reservation, Ute Tribe of the Uintah and Ouray

TABLE 6-3
TRIBAL CONTACTS AND CONSULTATION

Tribe	**Type of Contact**				**Response**
	Letters			**Meetings**	
	April 1, 2011[1]	**March 2/ April 4, 2012**[2]	**May 30, 2014**[3]		
					Reservation, and the Ute Mountain Ute Tribe of the Ute Mountain Ute Reservation) to give a presentation to introduce and discuss the Project.
Ute Indian Tribe of the Uintah and Ouray Reservation	✓	✓	✓	April 23, 2012 May 20, 2015	In a letter dated January 27, 2012, the BLM offered to give a presentation to the Ute Tribe Business Committee and to meet with the Director, Ute Tribe Cultural Rights and Protection. In response, a meeting was arranged for April 23, 2012, in Fort Duchesne with the Ute Tribe Energy & Minerals Department. In follow-up letters dated April 23 and September 3, 2013, the BLM wrote to the Director, Ute Tribe Energy & Minerals Department and Ute Tribal Chairman and Council, respectively, to summarize the outreach with the tribe to date, to invite the tribe's participation as a cooperating agency, and to request a meeting or meetings with the Department, Ute Tribal Council and/or Ute Business Committee. On May 28 and July 10, 2013, the BLM followed up with email messages to the Director, Ute Tribe Cultural Rights and Protection requesting a meeting to discuss consultation and the Section 106 draft Programmatic Agreement, and inviting participation in a Consulting

TABLE 6-3
TRIBAL CONTACTS AND CONSULTATION

Tribe	Type of Contact				Response
	Letters			Meetings	
	April 1, 2011[1]	March 2/ April 4, 2012[2]	May 30, 2014[3]		
					Parties meeting to review and discuss the draft Programmatic Agreement. On June 3, 2014, the BLM wrote to the Acting Superintendent of the Bureau of Indian Affairs for the Uintah and Ouray Agency at Fort Duchesne, Utah, to provide a Project update. The letter provided a summary of the BLM's outreach to date to receive comments on the Draft EIS and requested a meeting with the Tribal Council and Business Committee to provide a project update and to further Government-to-Government consultation responsibilities. In April 2015, the BLM sent a letter to the newly appointed superintendent of the BIA Uintah and Ouray Agency at Fort Duchesne, Utah, to provide a Project update and request assistance in arranging a meeting with the Tribe. On May 20, 2015, the BLM National Transmission Support Team Archaeologist met with the Ute Tribe Director of Cultural Rights and Protection Office to provide an update of this and other projects. In July 2015, the BLM sent a letter to the newly appointed Chairperson of the Ute Indian Tribe providing a Project update and requesting a meeting.

TABLE 6-3
TRIBAL CONTACTS AND CONSULTATION

Tribe	**Type of Contact**				**Response**
	Letters			**Meetings**	
	April 1, 2011[1]	**March 2/ April 4, 2012**[2]	**May 30, 2014**[3]		
Ute Mountain Ute Tribe of the Ute Mountain Ute Reservation	✓	✓	✓		In a letter dated May 3, 2011, the tribe responded to the April 1, 2011, letter that they intend to participate in government-to-government consultation for the Project.

NOTES:

[1] The BLM sent a letter to the tribes to introduce the Project, explain the preparation of the environmental impact statement, and request government-to-government consultation.

[2] The March 2, 2012, letter from the BLM invited the tribes to participate in consultation under Section 106 of the National Historic Preservation Act and invited them to participate in a meeting to discuss preparation of the Programmatic Agreement. The April 4, 2012, letter provided the date of and background information for the meeting (on April 11, 2012).

[3] The BLM sent a letter to 24 American Indian tribes to review and discuss the modifications of the draft Programmatic Agreement and invited them to participate in a meeting to provide comments on this document. The letter provided the date of and background information for the meeting (on June 24, 2014).

- As of the date of this Final EIS, the majority of the tribes contacted have not responded to the BLM's invitation to participate in the development of the Programmatic Agreement as concurring parties.
- Twenty-four American Indian tribes were invited to attend a meeting with consulting parties conducted by the BLM to discuss the Programmatic Agreement. The BLM receive no responses from the other tribes.
- One tribe, the Pueblo of Santa Ana, sent an email to the BLM stating they have no connections to the areas involved on the Project and wished to receive no further communications.

To date, the BLM has received no substantive comments from the American Indian tribes contacted.

6.2.3 Other Coordination

Several federal and state agencies and local governments were consulted during the course of the environmental studies to request data and solicit information and comments. A list of all agency and stakeholder meetings is presented in Appendix C. In addition, information provided by the Applicant on Applicant-initiated public outreach activities is included in Appendix C.

6.3 Scoping Process

The scoping process is purposefully conducted early in the EIS and land-use planning process and is open to all interested agencies and the public. The intent is to solicit comments and identify issues that help direct the approach and depth of the environmental studies and analysis needed to prepare the EIS. Objectives to meet this goal include the following:

- Identify and invite agencies with jurisdiction and/or special expertise relevant to the Project to participate in the preparation of the EIS as cooperating agencies
- Identify other interested parties and invite them to participate in the NEPA process
- Identify other environmental review and consultation requirements
- Identify the relevant and substantive issues that need to be addressed during the studies and in the EIS
- Determine the range of alternatives to be evaluated
- Develop the environmental analysis criteria and systematic process, allocating EIS assignments among agencies, as appropriate

The scoping process is summarized in this section and documented in the *Energy Gateway South Transmission Project EIS Scoping Report* (BLM 2011a), which is available for viewing at the BLM field offices and on the BLM Project website (refer to the following section for its address). The issues derived from scoping comments are listed in Chapter 1, Table 1-1.

6.3.1 Approach

The range of issues summarized in this document was derived from the scoping process and ongoing public involvement. Some of the activities implemented early in the Project are listed below.

- Agency, interagency, and stakeholder meetings (listed in Appendix C) were held to discuss the Project and to solicit comments.
- Announcements to inform the public of the Project, EIS preparation, and public scoping meetings included the *Federal Register* NOI (April 1, 2011), and media releases to local newspapers and

radio stations, legal notices, and the Environmental Notification Bulletin Board (ENBB, posted March 2011) .

- A newsletter was distributed to interested parties on the Project mailing list, which includes federal, state, and local government agencies, special interest groups, and individuals—a total of approximately 15,400 parties. The newsletter introduced the Project, solicited input for the environmental analysis, and announced upcoming public scoping meetings.
- The BLM-established Project website contains a brief description of the Project, the purpose of and need for the Project, an EIS timeline, the Draft EIS, newsletters, right-of-way information, geotechnical investigations, scoping reports, maps, and a schedule. A link was provided for the public to submit comments via email at BLM_WY-GatewaySouth@blm.gov. (http://www.blm.gov/wy/st/en/info/NEPA/documents/hdd/gateway_south.html)
- Twelve formal scoping meetings were held in May and early June 2011, to introduce the Project, explain the purpose of and need for the Project, describe the Project, explain the planning and permitting process, and solicit comments useful for the environmental analysis.

In addition, the Applicant assembled four community working groups representing diverse interests associated with the Project area. To date, each Community Work Group has met one time to provide input to the Applicant on the Project.

6.3.1.1 Information Dissemination and Notification

Mailing lists maintained by the BLM Rawlins, Rock Springs, Grand Junction, Little Snake, White River, Glenwood Springs, Cedar City, Fillmore, Moab, Price, Salt Lake, Vernal, and Richfield Field Offices and the Ashley, Manti-La Sal, Uinta-Wasatch-Cache, Medicine Bow-Routt, and White River National Forests were compiled along with a list of federal, state, and local agency representatives, community leaders, and potential stakeholders. Ranchers with grazing allotments on lands administered by the BLM and/or USFS and current BLM lease holders, whose contact information was extracted from the LR2000 database, also were added to the Project mailing list. Other additions included interested organizations and individuals who commented on the Project or requested information. The mailing list is used to distribute scoping announcements and subsequent updates on the status of the Project.

As explained in Section 6.2, information about the Project was disseminated early in the NEPA process through the *Federal Register*, a newsletter, media releases and advertisements, and website postings.

A NOI was published in the *Federal Register* on April 1, 2011 (Vol. 76, No. 63, pages 18241 to 18243), announcing the preparation of the EIS for the proposed Project and the opportunity for the public to participate in the process and provide input. The publication of the NOI in the *Federal Register* marked the beginning of EIS preparation and the scoping process.

The first in a series of newsletters was mailed by the BLM in March 2011 to approximately 8,100 individuals, agencies, and interested organizations on the Project mailing list. In addition, the Applicant prepared a list of the landowners within a 2-mile-wide corridor along the alternative routes (1 mile on either side of the reference centerline and approximately 7,300 landowners), sent a letter introducing the Project, and encouraged the landowners to participate in the federal scoping process. Media releases and newspaper notices were placed in regional and local newspapers (Table 6-4). Also, the BLM posted Project information and announcement of the meetings on the BLM public website and on the ENBB in mid-March 2011.

TABLE 6-4
PRESS RELEASES AND LEGAL NOTICES

Newspaper	Legal Notice Publication Dates
Mt. Pleasant Pyramid, Sanpete County, Utah	May 19 and 26, 2011
The Moab Times-Independent, Moab, Utah	May 19 and 26, 2011
The Times-News, Nephi, Utah	May 11 and 18, 2011
Sun Advocate, Price, Utah	May 17 and 24, 2011
Sanpete Messenger, Sanpete County, Utah	May 11, 18, and 25, 2011
Uintah Basin Standard, Roosevelt, Utah	May 10 and 17, 2011
Vernal Express, Vernal, Utah	May 11 and 18, 2011
Craig Daily Press, Craig, Colorado	May 4 and 11, 2011
Grand Junction Free Press, Grand Junction, Colorado	May 6 and 13, 2011
The Daily Sentinel, Grand Junction, Colorado	May 4 and 11, 2011
Rio Blanco Herald Times, Rio Blanco County, Colorado	May 5 and 12, 2011
The Citizen Telegram, Rifle, Colorado	May 5 and 12, 2011
Emery County Progress, Emery County, Utah	May 17 and 24, 2011
Laramie Boomerang, Laramie, Wyoming	April 26 and May 3, 2011
Rawlins Daily Times, Rawlins Wyoming	April 26 and May 3, 2011
The Rocket-Miner, Rock Springs, Wyoming	April 27 and May 4, 2011
Saratoga Sun, Carbon County, Wyoming	April 27 and May 4, 2011
Snake River Press, Baggs, Wyoming	April 15 and 29, 2011

Scoping Meetings

Twelve scoping meetings were held in May and early June 2011 to inform the public about the Project and the NEPA process and to solicit input on the scope of the Project and potential issues. The scoping meetings were held from 4:30 to 7:30 p.m. at the locations and dates listed below:

Baggs, Wyoming
Tuesday, May 10, 2011

Rock Spring, Wyoming
Wednesday, May 11, 2011

Rawlins, Wyoming
Thursday, May 12, 2011

Craig, Colorado
Tuesday, May 17, 2011

Rangely, Colorado
Wednesday, May 18, 2011

Grand Junction, Colorado
Thursday, May 19, 2011

Roosevelt, Utah
Tuesday, May 24, 2011

Fort Duchesne, Utah
Wednesday, May 25, 2011

Nephi, Utah
Thursday, May 26, 2011

Price, Utah
Tuesday, May 31, 2011

Mount Pleasant, Utah
Wednesday, June 1, 2011

Green River, Utah
Thursday, June 2, 2011

An open-house format was used for the meetings. Handouts at the meetings included a Project map, the initial newsletter, and comment form. Several information display stations were positioned around the meeting room to help explain the purpose of and need for the Project, Project description (including Project maps), environmental studies and analyses to be completed, NEPA process timeline, cooperating agencies, how to submit comments, and scoping meeting dates and locations. One station in the meeting room was equipped with an automated, 3-dimensional "virtual tour" of the alternative routes. Those individuals interested could view the virtual tour along one or more of the alternative routes. Another station was attended by the Applicant's realty agents who were able to answer landowner questions about the location of the alternative routes in relation to their properties. Another station was equipped with two computers loaded with the form developed to document comments from individuals. Representatives from the BLM, the Applicant, and EPG (the third-party environmental consulting team assisting the BLM) were present and available to explain the displays, answer questions, and assist in accepting and recording comments. A total of 231 members of the public attended the scoping meetings.

Written comments were accepted at the public scoping meetings, via electronic mail, and via U.S. mail at the BLM Wyoming State Office. Although the publication of the NOI initiated a 90-day public scoping period, scoping comments were accepted until June 30, 2011, 28 days after the last public scoping meeting.

6.3.2 Scoping Results

The public scoping process and results of scoping efforts are documented in the *Energy Gateway South Transmission Project EIS Scoping Report* (BLM 2011a), which is available for viewing on the BLM Project website. Availability of the Scoping Report was announced through the second in a series of newsletters sent to all parties on the Project mailing list and on the BLM Project website. A summary of the issues derived from comments received are listed in Chapter 1, Table 1-1.

6.3.3 Public Review of the Environmental Impact Statement and Land-use Plan Amendments

The BLM and USFS each published a NOA of the Draft EIS for public review and comment in the *Federal Register* on February 21, 2014. The EPA also published a NOA of the Draft EIS for public review and comment in the *Federal Register* on the same day, which initiated a 90-day public comment period. Approximately 29 paper copies and 194 electronic copies of the Draft EIS were distributed in February 2014 to federal agencies; tribal, state, and local governments; organizations; and individuals. The availability of the Draft EIS; deadline for public comments; and locations, dates, and times of public meetings on the Draft EIS were announced in paid newspaper notices, media releases, and a newsletters that was mailed to all parties on the Project mailing list including potentially affected property owners, agencies, stakeholders and other interested parties. During the comment period, BLM held 12 public meetings to provide information and solicit public comments on the Draft EIS (Table 6-5). A total of 279 people attended the public open houses.

TABLE 6-5
PUBLIC MEETINGS AND ATTENDANCE

Meeting Location and Date	Total Attendance	Meeting Location and Date	Total Attendance
Grand Junction, Colorado March 10, 2014	5	Mount Pleasant, Utah March 19, 2014	23
Vernal, Utah March 11, 2014	12	Nephi, Utah March 20, 2014	27
Fort Duchesne, Utah March 12, 2014	14	Rangely, Colorado March 31, 2014	4
Roosevelt, Utah March 13, 2014	11	Craig, Colorado April 1, 2014	22
Green River, Utah March 17, 2014	8	Baggs, Wyoming April 2, 2014	34
Price, Utah March 18, 2014	81	Rawlins, Wyoming April 3, 2014	38

The comment period ended on May 22, 2014. BLM received 603 submittals containing comments from federal, state, and local agencies; public and private organizations; and individuals, of which 301 were one version of a form letter and 126 were a form postcard. The comments in each submittal were identified, recorded, and analyzed. Responses were prepared for all substantive comments. The comments received and responses to the substantive comments are provided in Appendix P.

6.3.4 Final Environmental Impact Statement and Land-use Plan Amendments

All written and oral comments on the Draft EIS and LUPAs received during the 90-day period were compiled and analyzed, and responses are included in the Final EIS and Proposed LUPAs. A *Federal Register* NOA of the Final EIS and Proposed LUPAs has been published by the BLM, which contains information about the Project and the 30-day availability period for the Final EIS and concurrent 30-day protest period for the Proposed LUPAs and filing instructions. Also, the BLM will provide a 60-day review period to the Governors of the states in which LUPAs are being proposed to ensure consistency with state and local plans, policies, and programs. The availability and protest periods and Governors' consistency review will occur simultaneously. Any responses from a Governor on consistency must be resolved before RODs are issued.

The USFS will issue a separate *Federal Register* NOA of the Final EIS and Proposed LUPAs and a draft USFS ROD and will publish a legal notice in the newspapers of record. The notices will contain information about the Project and the 45-day objection period, which begins with the publication of the legal notice in the newspapers of record. Any objections will be reviewed by the reviewing officer during a 45-day objection review period, which will begin at the end of the 45-day objection period. The objection review period may be extended up to an additional 30 days at the discretion of the reviewing officers. All objections received will be responded to, in writing, by the reviewing official before proceeding. The written response(s) may contain instructions to the responsible official. Once the reviewing officer has issued the response(s) to the objections, and the responsible official has followed any instructions contained in the written response(s), the responsible official may sign the final ROD and implement the Project.

The BLM and USFS will each issue a ROD and other affected federal agencies with decisions to make may each issue a ROD summarizing the findings and decisions regarding the preferred alternative for the Proposed Action and its determination regarding compliance with NEPA and other regulations. Also, the

RODs will document the management decisions made regarding applicable amendments to land-use plans.

6.4 Applicant-initiated Activities

Four community working groups, created to provide a forum for input into the transmission line siting studies, consisted of representatives from cities, counties, and stakeholders in the northern and southern portions of the Project area. While the community working groups are not decision-making entities, members were asked to provide feedback on the Project and consider the views of the group, as well as the views of their respective organizations and/or communities. To date, the community working groups have each met one time. The first series of meetings were held in September 2012 in Rawlins, Wyoming, and Salt Lake City, Nephi, and Price, Utah. The purpose was to (1) introduce the proposed Project, (2) gather input regarding the scope of the Project and alternative routes, and (3) identify issues that would help the Applicant in developing the transmission line. A second series of meetings was conducted in February 2014 in the same locations.

In addition, the Applicant posted a general description of the Project on their communications website (www.pacificorp.com/transmission) and conducted briefings of community leaders to introduce and continue to keep them informed about the Project. A list of additional community outreach meetings is included in Appendix C.

In addition, the Applicant will continue to provide updates and information regarding the Project to all the counties and cities that require conditional use permits and general plan amendments.

6.5 Preparers and Contributors

Preparers, contributors, and consultants involved throughout the Project (including BLM and USFS staff), are listed in Tables 6-6, 6-7, and 6-8.

TABLE 6-6
BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS

Name	Title	Involvement
Bureau of Land Management		
Project Management		
Tamara Gertsch	National Project Manager	Project management and coordination
Scott Whitesides		National Transmission Support Team (NTST) National Environmental Policy Act (NEPA) Support
Christine Pontarolo	Biologist	NTST Biological Resources Support
Jenna Gaston	Cultural Resources Specialist	NTST Cultural Resources Support
Beverly Gorny	Public Affairs Specialist Project Assistant	Public affairs
Tamera Hammack	Web Specialist	Website maintenance
Wyoming		
Wyoming State Office		
Brent Breithaupt	Regional Paleontologist	Paleontological resources
Ranel Capron	State Archaeologist Project Lead – Cultural Resources	Cultural resources
Christopher Carlton	Planning and NEPA	NEPA compliance review
Sherry Lahti	State Program Lead – Visual Resource Management	Visual resources

TABLE 6-6
BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS

Name	Title	Involvement
Pamela Murdock	Branch Chief, Planning and Environmental Coordination	NEPA and planning support
Dennis Saville	Project Lead – Wildlife	Wildlife resources
Janelle Wrigley	State Program Lead – Realty	Project management, lands, access
Mary Wilson	Chief, Office of Communications	State Project Lead, external communications
Rawlins Field Office		
Ron Biegel	Realty Specialist	Lands and realty
Frank Blomquist	Wildlife Biologist Project Lead – Wildlife	Wildlife resources
Bonni Bruce	Supervisory Archaeologist State Project Lead – Cultural Resources	Cultural resources
Mike Calton	Range Management Specialist	Wild horses and burros
Dennis Carpenter	Field Manager	
Robert Epp	Range Management Specialist	Livestock grazing
Bruce Estvold	Civil Engineer	
Susan Foley	Soil Scientist	Earth resources, vegetation
Martha Hemphill	Archaeologist	Cultural resources
David Hullum	Outdoor Recreation Planner	Recreation, visual resources
Lynn McCarthy	Geographic Information System (GIS) Specialist	GIS
Mark Newman	Geologist	Earth resources
Kelly Owens	Hydrologist	Water resources
Richard Putnam	Fire/Fuels Specialist	Fire/Fuels
John Russell	RECO Project Manager	
Heather Schultz	RECO Project Manager	Field Office Point of Contact, lands and realty
Colorado		
Colorado State Office		
Maryanne Kurtinaitis	Renewable Energy program Manager	State Point of Contact: retired
Northwest District Office		
Jim Cagney	Northwest District Manager	District Office Point of Contact; retired
David Rosenkrance	Associate District Manager	District Office Point of Contact; retired
Grand Junction Field Office		
Doug Diekman	Information Technology (IT) Specialist	GIS
Jim Dollerschell	Rangeland Management Specialist	Range, wild horses
Collin Ewing	Planning and NEPA Specialist	NEPA and planning support
Scott Gerwe	Geologist	Minerals, paleontology, groundwater
Lathan Johnson	Fire/Fuels Specialist	Fire/Fuels
Erin Dreyfuss Jones	NEPA Coordinator	Field Office Point of Contact
Alyssa A. Levitt-Reynolds	Archaeologist	Cultural resources
Anna Lincoln	Ecologist	Range, threatened and endangered plants
Heidi Plank	Wildlife Biologist	Wildlife, threatened and endangered wildlife
Christina Stark	Natural Resource Specialist	Lands and realty
Katie Stevens	Field Manager	
Mark Taber	Natural Resource Specialist	Weeds
Cathy Ventling	Natural Resource Specialist	Natural resources

TABLE 6-6
BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS

Name	Title	Involvement
Little Snake Field Office		
Desa Ausmus	State Project Lead – Wildlife	Wildlife
Pam Levitt	IT Specialist (GIS)	GIS
Kathy McKinstry	Environmental Coordinator	NEPA and planning support
Louise McMinn	Realty Specialist	Field Office Point of Contact, lands and realty
Jimmy Michels	Fire/Fuels Specialist	Fire/Fuels
Wendy Reynolds	Field Manager	
Gina Robison	Outdoor Recreation Planner	Recreation, travel management, visual resource management, wilderness
Brian Naze (replaced Kim Ryan)	Archaeologist	Cultural resources
Hunter Seim	Lead Rangeland Management Specialist	Range
Eric Scherff (replaced Emily Spencer)	Ecologist	Soil, water, air
Dario Archuleta	Travel Management	Travel management
White River Field Office		
Lisa Belmonte	Wildlife Biologist	Wildlife, threatened and endangered animals, riparian
Richard Brooks	IT Specialist	GIS
Janet Doll	Realty Specialist	Field Office Point of Contact, lands and realty
Matt Dupire	Rangeland Management Specialist	Range, vegetation, noxious weeds
Baili Foster	Seasonal Ecologist	Special designation and other management areas
Melissa Kindall	Range Technician	Wild horse
Bob Lange	Hydrologist	Soil, water, air
Ester McCullough	Associate Field Manager	
Jimmy Michels	Fire/Fuels Specialist	Fire/Fuels
Heather Sauls	Planning and Environmental Coordinator	NEPA and planning support
Chad Schneckenburger	Outdoor Recreation Planner	Recreation, visual resource management, travel management
Michael Selle	Archaeologist	Cultural resources, paleontology
Kent Walter	Field Manager	
Heather Woodruff	Range Management Specialist	Special status plants
Utah		
Utah State Office		
Lola Bird	External affairs	
Shauna Derbyshire	Realty Specialist	State Project Lead, lands and realty
Carla Garrison	IT Specialist	GIS
Jeremy Jarnecke	Hydrologist	Hydrology
Pamela Jarnecke	Branch Chief, Planning and Environmental Coordination	Project Lead, NEPA and planning support
Byron Loosle	Archaeologist State Project Lead – Cultural Resources	Cultural resources
Whitney May	Visual Resource Management Specialist	Visual resources

TABLE 6-6
BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS

Name	Title	Involvement
Robin Naeve	Biologist	State Project Lead, wildlife
Jeremy Sisneros	Fire/Fuels Specialist	Fire/Fuels
Rob Sweeten	Landscape Architect Visual Resource Management Specialist, National Scenic and Historic Trails	State Project Lead, visual resources, National Scenic and Historic Trails
Color Country District		
Todd Christensen	District Manager	
Randy Trujillo	Associate District Manager	
West Desert District		
Kevin Oliver	District Manager	
David Whitaker	Emergency Stabilization and Reclamation Coordinator	Vegetation, threatened and endangered plants
Chad Kunz	Civil Engineer	Roads, facilities
Fillmore Field Office		
Gary Bishop	Assistant Fire Management Officer	Fire prevention
Steven Bonar	Outdoor Recreation Planner	Recreation, areas of critical environmental concern (ACECs), wilderness
Paul Caso	Rangeland Management Specialist	Air quality, range, floodplains, water rights, water quality
Michael Gates	Field Manager	
Cindy Ledbetter	Environmental Coordinator	NEPA and Planning
Joelle McCarthy	Assistant Field Manager Non-Renewables, Archaeologist	Cultural resources, tribal consultation, historic trails
R.B. Probert	Bio Science Tech (Plants)	Range, weeds
Eric Reid	Assistant Field Manager Renewables	Renewables
Clara Stevens	Realty Specialist	Field Office Point of Contact, lands and realty
Bill Thompson	Rangeland Management Specialist	Wetlands, riparian, farmlands, vegetation
Moab Field Office		
Ann Marie Aubry	Hydrologist	Hydrology, riparian areas
Jean Carson	GIS Specialist	GIS
Jordan Davis	Rangeland Management Specialist	Weeds
Jan Denney	Realty Specialist	Field Office Point of Contact, lands and realty
Rebecca Doolittle	Geologist	Geology, minerals, soils
Aron King	Archaeologist	Cultural resources, tribal consultation
Don Montoya	Archaeologist	Cultural resources, tribal consultation
Pam Riddle	Wildlife Biologist	Wildlife, special status species
Bill Stevens	Outdoor Recreation Planner	Wilderness, WSR, socioeconomics
Katie Stevens	Outdoor Recreation Planner	Recreation, ACECs
Doug Wight	GIS Specialist	GIS
David Williams	Range Management Specialist	Range
Price Field Office		
Patricia Clabaugh	Field Manager	
Karl Ivory	Rangeland Management Specialist	NRS, threatened and endangered plants
Floyd Johnson	Planner	NEPA and planning
Amber Koski	Archaeologist	Cultural resources
Don Kranendonk	Assistant Field Manager	

TABLE 6-6 BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS		
Name	**Title**	**Involvement**
Connie Leschin	Realty Specialist	Field Office Point of Contact, lands and realty
Ahmed Mohsen	Associate Field Manager	NEPA and planning
Tyler Nelson	GIS Specialist	GIS
Jared Reese	Natural Resource Specialist	Wildlife biology
Richfield Field Office		
Jason Anderson	GIS Specialist	
Stan Anderson	Field Manager	
Dona Bastian		Wild horses
Bob Bate		Forestry, fire
Chris Colton	Assistant Field Manager, Range	
Jennifer Evans	Outdoor Recreation Planner	Recreation, visual resource management, ACECs, wilderness, wild and scenic rivers, natural areas
Larry Greenwood	Wildlife Biologist	Wildlife, special status species
Myron Jeffs	Outdoor Recreation Planner	Recreation, visual resource management, ACECs, wilderness, wild and scenic rivers, natural areas
Joe Manning	Geologist	Geology, paleontology
Michael Utley	Realty Specialist	Field Office Point of Contact, lands and realty
Wayne Wetzel	Field Manager	
Burke Williams	Natural Resource Specialist	Weeds, range
Phil Zieg	Soil Conservationist	Air, water quality
Salt Lake Field Office		
Traci Allen	Biologist	
Mike Nelson	Field Manager, Realty Specialist	Lands and realty
Pam Schuller	Environmental Coordinator	
Dave Watson	Realty Specialist	Field Office Point of Contact, lands and realty
Vernal Field Office		
Cameron Cox	Archaeologist	Cultural resources
Daniel Emmett	Biologist	State Project Lead – Wildlife
Elizabeth Gamber	Geologist	Paleontology
Robin Hansen	Petroleum Engineer	Minerals, energy resources
James Hereford	Natural Resource Specialist Environmental Scientist	
Stephanie Howard	NEPA Specialist	NEPA and planning
Jerry Kenczka	Assistant Field Manager Minerals	
Maggie Martson	Range Management Specialist	Range management
Cindy McKee	Realty Specialist	Field Office Point of Contact, lands and realty
Stan Olmstead		Range, water quality
David Palmer	Forester	Forestry
Aaron Roe	Botanist	Botany, weeds, and vegetation
Michael Stiewig	Field Manager	
Steve Strong	Natural Resource Specialist	Soils
Jason West	Natural Resource Specialist	Recreation, visual resource management, wilderness, ACECs, wild and scenic rivers

TABLE 6-6 BUREAU OF LAND MANAGEMENT PREPARERS AND CONTRIBUTORS		
Name	**Title**	**Involvement**
Bureau of Land Management National Operations Center		
David Maxwell	Air quality Specialist	Air quality support
Karla Rogers	Visual Resource Management	Visual resources support
Josh Sidon	Socioeconomist	Social and economic conditions support
U.S. Department of the Interior Office of Environmental Policy and Compliance		
David Sire	Regional Environmental Officer	NEPA
Robert Stewart	Regional Environmental Officer	NEPA
Lisa Treichel	Regional Environmental Officer	NEPA

TABLE 6-7 U.S. FOREST SERVICE PREPARERS AND CONTRIBUTORS		
Name	**Title**	**Involvement**
Kelsha Anderson	Soil Scientist	Soils
Scott Bingham	Ashley National Forest	Point of Contact (Forest)
Kenton Call	Project Lead	Project management
Joe DiBenedetto	Paleontologist	Paleontology
Kevin Draper	Landscape Architect	Visual resources
Rick Dustin	Landscape Architect	Visual resources
Mike Fracasso	Paleontologist	Paleontology
Anne Hansen	Uinta-Wasatch-Cache National Forest	Project Point of Contact (Forest)
Melissa Hearst	Intermountain Region	Project Point of Contact (Region)
Chad Hermandorfer	Hydrologist (TEAMS)	Water resources
Marian Jacklin	Archaeologist	Cultural resources
Jenna Jorgensen	Wildlife Biologist	
Nate Lewis	Environmental Coordinator	Recreation, lands, special uses, and roadless areas
Tom Lloyd	Manti-La Sal National Forest	Project Point of Contact (Forest)
Chris Mease	Fisheries Biologist (TEAMS)	Fisheries
Tim Metzger	Fire Specialist (AMSET)	Fire/Fuels
Terry Miller	Botanist (TEAMS)	Plants
Andrew Orlemann	Silviculturalist (TEAMS)	Forestry
Cheryl Probert	Deputy Forest Supervisor, Uinta-Wasatch-Cache national Forest	Forest Service Authorized Officer
David Ream	Intermountain Region	Project Point of Contact (Region)
Charlie Rosier	Recreation Specialist	Recreation, lands, and special uses
Lucretia Smith	GIS Coordinator, Range Specialist (TEAMS)	GIS, range
Stacey Weems	Soil Scientist	Soils
Josh Wilson	NEPA Specialist (AMSET)	NEPA and planning support

TABLE 6-8 CONSULTANT PREPARERS AND CONTRIBUTORS		
Name	**Education**	**Involvement**
Environmental Planning Group (EPG)		
Ryan Baum	MS, Geographic Information Sciences BS, Biology	Geographic Information Systems

TABLE 6-8
CONSULTANT PREPARERS AND CONTRIBUTORS

Name	Education	Involvement
Timothy G. Baumann, CWB	MS, Wildlife Biology BS, Biology	Vegetation resources, special status plants, wildlife, special status wildlife, and fish and aquatic resources
Louise Brown	BS, Administrative Systems	Document management, editor
Suzy Cavanagh	MS, Geology BS, Biology	Earth resources and paleontological resources
John Curl	BS, Public Lands Policy	Biological resources, supporting information
Brian Doubek	BS, Earth Science (Geography)	Geographic Information Systems
Michael Doyle	MLA, Landscape Architecture BS, Environmental Design	Principal-in-charge, technical review
Megan Dunford	MLA, Landscape Architecture BA, Advertising and Interpersonal Communications	Land use and recreation
Thomas J. Ersfeld	BA, International Political Economy	Document preparation , bibliography
Adrien Elseroad	MS, Forestry BS, Natural Resources	Wildlife resources
Suzanne Eskenazi	MA, Anthropology BA, Anthropology	Cultural and historical resources
Nate Ferguson	BLA, Landscape Architecture and Environmental Planning	Visual resources and environmental planning
Naia George	MS, Anthropology (Archaeology/Physical Anthropology) BS, Anthropology	Cultural and historical resources
Lynne Gilbert-Norton, PhD	PhD, Wildlife Biology MS, Psychology – Animal Behavior BS, Psychology	Wildlife resources
Peter Goodwin	BA, Biology with Plant Ecology Focus	Vegetation and special status plants
Gena Huffman	MS, Anthropology BA, Political Science and Anthropology	Cultural and historical resources
Sally Jurin	MS, Education BA, Grammar	Technical editor
Jonathan Knight	BS, Geography	Geographic Information Systems
Mike McConnell	BS, Wildlife Resources	Water resources, fish and aquatic resources
Sarah Nelson	MLA, Landscape Architecture and Environmental Planning BA, Anthropology	Geographic Information System
Amanda O’Connor	MS, Conservation Studies BA, Environmental Biology	Senior technical review, NEPA and planning coordination
Mike Pasenko	MS, Quaternary Sciences Program BA, Anthropology	Earth and water resources, paleontology
Mary Pendergast, PhD	PhD, Ecology and Biology BS, Chemistry and Biology	Special status wildlife resources
Reid Persing	BA, Chemistry and Biochemistry	Vegetation and special status plant resources
Scott Peters	BLA, Landscape Architecture	Access roads and disturbance
Kevin Rauhe	BLA, Landscape Architecture	Visual resources
Jan Reed	MS, Ecology BA, Environmental Studies	Vegetation and special status plants

TABLE 6-8
CONSULTANT PREPARERS AND CONTRIBUTORS

Name	Education	Involvement
Matt Sauter	MS, Paleontology BA, Geology	Earth and water resources, paleontology
Marc Schwartz	BS, Forestry/Ecosystem Management	Visual resources
Chris Smith	MLA, Landscape Architecture BA, History	Project coordination
Cindy Smith	BS, Liberal Arts and Sciences	Project management
Linwood Smith	PhD, Zoology MS, Zoology BA, Zoology	Wildlife biology and vegetation resources
Danielle Stevens	BA, English BS, Environmental Science	Technical editor
Jennifer Streeter	MS, Geography BS, Geography	Geographic Information Systems
Marty Thomas	BA, English BA, Anthropology	Cultural and historical resources
Nikki Wallenta	BS, Land Use Planning	Land use and recreation
Heather Weymouth	MS, American Studies (Anthropology) BIS, Anthropology	Cultural and historical resources
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Glossary

GLOSSARY

A

A.D. – Anno Domini. Dating system devised in 525 to enumerate the years used with the Julian and Gregorian calendars, which are based on the traditionally reckoned year of the birth of Jesus of Nazareth.

A-weighted sound level – Sound that is measured with a sound-level meter using the A-weighted response filter built into the meter circuitry. The A-weighted filter simulates the frequency response to the human ear.

Access (road) – Road used for passage to and along transmission line for purposes of construction and maintenance.

Active lek – Any lek that has been attended by male greater sage-grouse during the strutting season. Presence can be documented by observing birds using the site or by signs of strutting activity.

Active raptor nest site – Any identified raptor nest site that could provide a nesting opportunity for a raptor. Temporal and spatial stipulation will be applied.

Advisory Council on Historic Preservation (ACHP) – An independent federal agency that advises the President and Congress on historic preservation matters and oversees the review of projects under Section 106 of the National Historic Preservation Act (NHPA).

Affected environment – (1) A geographic area and the associated natural, human, and cultural resources that could be influenced by a proposed action. (2) The chapter in an environmental impact statement (EIS) that describes the existing condition of the environment.

Agency Interdisciplinary Team – A group of individuals with different training, representing the physical sciences, social sciences, and environmental design arts, assembled to solve a problem or perform a task. The members of the team proceed to a solution with frequent interaction so that each discipline can provide insights on any stage of the problem and disciplines can combine to provide new solutions.

Aggregate – A group or mass of distinct things gathered into, or considered as, a total or a whole.

Albedo – A measure of a material’s ability to reflect sunlight (including the visible, infrared, and ultraviolet wavelengths) on a scale of 0 to 1. An albedo value of 0.0 indicates the surface absorbs all solar radiation, and a 1.0 albedo value represents total reflectivity. The *ENERGY STAR Reflective Roof Products* criteria specify an albedo of 0.65 or higher for low-slope roof applications and 0.25 for sloped roofs.

Alignment – The specific, surveyed route of a transmission line.

All-terrain vehicle (ATV) – A wheeled or tracked vehicle, other than a snowmobile or work vehicle, designed primarily for recreational use or for the transportation of property or equipment exclusively on undeveloped road rights-of-way, marshland, open country, or other unprepared surfaces.

Allotment – An area of land where one or more livestock operators graze their livestock. Allotments consist or land administered by the Bureau of Land Management (BLM) and usually include other federally managed, state-administered, and private land. Ana allotment may include one or more pastures. Livestock numbers and periods of use are specified for each allotment.

Alluvium – A general term for clay, silt, sand, gravel, or similar consolidated material deposited during a comparatively recent geologic time by a stream or other body of running water in the bed of a stream, river, or floodplain, or as a cone or fan at the base of a mountain slope.

Alternating current (AC) – The flow of electric charge periodically reverses direction. (In direct current [DC], the flow of electric charge is only in one direction.)

Alternative (action) – An option for meeting the stated need.

Alternative (route) – An optional path or direction for a transmission line.

Ambient air – Any unconfined portion of the atmosphere: open air, surrounding air.

Amendment – The process for considering or making changes in the terms, conditions, and decisions of approved land-use plans using the prescribed provisions for resource management planning appropriate to the proposed action or circumstances.

American Indian tribe – Indian tribes as defined in the National Historic Preservation Act of 1966 54 U.S.C. 300101 (as recodified): Indian tribe means an Indian tribe, band, nation, or other organized group or community, including a Native village, Regional Corporation or Village Corporation, as those terms are defined in section 3 of the Alaska Native Claims Settlement Act (43 U.S.C. 1602), which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians (54 U.S.C. 300101 et seq. [as recodified]).

Animal unit month (AUM) – A standardized unit of measurement of the amount of forage necessary for the sustenance of one animal unit for 1 month; also, a unit of measurement that represents the privilege of grazing one animal unit for 1 month. An animal unit is a standardized unit of measurement for range livestock or wildlife. Generally, one mature cow (1,000 pounds) or its equivalent, based on an average daily forage consumption of 26 pounds of dry matter per day.

Annual (ecology) – A plant that completes its development in one year or one season and then dies.

Appeal – A formal action requesting a decision be reviewed by a higher authority. For the BLM this usually means review by the Interior Board of Land Appeals (IBLA).

Anthropogenic – Caused or influenced by humans.

Aquifer – A stratum of permeable rock, sand, etc., that contains water. Water source for a well.

Archaeology – The science that investigates the history of peoples by studying the material remains of past societies.

Area of Critical Environmental Concern (ACEC) – A BLM designation for an area within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or to protect life from natural hazards.

Artifact – Any object showing human workmanship or modification, especially from a prehistoric or historic culture.

Assessment (environment) – An evaluation of existing resources and potential impacts to those resources from a proposed act or change to the environment.

Attainment area – An area considered to have air quality as good as or better than the National Ambient Air Quality Standards, as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

Authorized Officer – Any employee of the Department of the Interior to whom has been delegated the authority to perform the duties defined. Under the BLM standard delegation (Manual 1203), this is no lower than the Field Office or District Manager. Delegation below this level should be specific to an individual and a specific right-of-way project.

Avoidance (as it relates to mitigation) – Avoiding the impact altogether by not taking a certain action or parts of an action (40 Code of Federal Regulations [CFR] 1508.20) (e.g., also may include avoiding the impact by moving the proposed action to a different time or location.).

Avoidance area – an area designated in a land use plan, for which use for a right-of-way should be avoided if at all possible.

B

B.P. – Before the present. As used in radiocarbon and other archaeological dating, the present is defined as A.D. 1950.

Background – The portion of the visual landscape lying from the outer limit of the middleground to infinity. Color and texture are subdued in this area, and visual sensitivity analysis is primarily concerned with the two-dimensional shape of landforms against the sky.

Background concentrations – Background concentrations are an essential part of the total air quality concentration to be considered when determining source impacts. Background air quality includes pollutant concentrations due to (1) natural sources, (2) nearby sources other than those currently under consideration, and (3) unidentified sources.

Batch plant – An area used for concrete mixing, temporary field office facility, material storage, and stations for equipment maintenance during construction of a transmission line. The area usually covers approximately 2 acres.

Bowen ratio – The ratio of energy available for sensible heating to energy available for latent heating.

Burial – Unmarked human interment or grave.

C

Cairn – A stack or mound of rocks used to mark the locations of boundaries or mining claims.

Candidate species – Any species included in the *Federal Register*'s Notice of Review being considered for listing as threatened or endangered by the U.S. Fish and Wildlife Service.

Campsite – A site occupied by a limited number of individuals either seasonally or for short periods of time. Such a site is frequently characterized by the presence of limited activity areas, artifact scatters (e.g., lithic debitage, lithic tools, ground stone, and ceramics), thermal features, or scatters of fire-cracked rock.

Capability – The ability to generate or transmit power.

Capacity – The load-carrying ability, expressed in megawatts (MW), of generation, transmission, or other electrical equipment.

Carbon monoxide (CO) – A colorless, odorless, poisonous gas produced by incomplete fossil fuel combustion. One of the six criteria pollutants.

Cenozoic – An era of geologic time from the beginning of the Tertiary period (65 million years ago) to the present.

Centerline – A line along the approximate middle of a transmission line right-of-way.

Circuit – A complete, closed conducting path over which electric current may flow.

Cist – A constructed/enclosed storage place that may be above, partially or completely underground and either lined or unlined

Clear and cut – Above-grade removal of vegetation to improve or provide suitable access for equipment. All vegetation is removed using above-grade cutting methods that leave the root crown intact. Soils are compacted, but no surface soil is removed. A dozer, grader, or other type of equipment may be used to move boulders or other obstructions that prevent overland travel. Additionally, minor areas where the planned access crosses a side slope that exceeds the allowable slope for access by construction or maintenance vehicles, may be graded to provide safe passage. The disturbed area will be blended, to the extent practicable, into the existing grades and revegetated according to the prescribed mitigations..

Colluvium – Soil and rock detritus accumulated at the bottom of a slope.

Compensatory mitigation – Compensating for the impact by replacing or providing substitute resources or environments (40 CFR 1508.20).

Compensatory mitigation ecological durability – Benefits from compensatory mitigation projects on compensatory mitigation sites persisting and influencing the landscape for as long as or longer than the projected impacts will negatively affect the resource.

Compensatory mitigation protective durability – Protection of compensatory mitigation sites from future and conflicting land uses or disturbances for as long as or longer than the projected impacts will negatively affect the resource.

Compensatory mitigation reversals – Damage to functioning compensatory mitigation sites that may be caused by natural disturbances (unintentional reversal, such as wildfire) or anthropogenic disturbances (intentional reversal, such as development) that shorten the intended duration of compensatory mitigation.

Compensatory mitigation projects – Specific, on-the-ground actions (mitigation measures) to improve habitats (e.g., chemical vegetation treatments).

Compensatory mitigation sites – The durable areas where compensatory mitigation projects will occur.

Conductor – The wire cable strung between transmission line towers through which the electrical current flows.

Conformance – A proposed action must be provided for specifically in a land use plan or, if not specifically mentioned, must be clearly consistent with the terms, conditions, and decisions of the approved plan or plan amendment.

Constraint – Environmental or engineering conditions or management prescriptions for a specific area limiting or precluding access to or siting of structures or facilities (e.g., terrain, airports, utility exclusion areas, etc.).

Contrast – The effect of a striking difference in the form, line, color, or texture of an area being viewed.

Contrast rating – A method of determining the extent of visual impact for an existing or proposed activity that would modify any landscape feature (land and water form, vegetation, and structures).

Corona – The discharge of energy from an energized transmission line that occurs when the voltage gradient exceeds the breakdown strength of air.

Cooperating agency – Any agency that has special jurisdiction by law or special expertise for proposals covered by the National Environmental Policy Act (NEPA) (40 CFR 1501.6). Any federal, state, tribal, or local government jurisdiction with such qualifications may become a cooperating agency, by agreement with the lead agency, to assist the lead agency in developing an environmental assessment (EA) or EIS.

Corridor – A tract of land forming a passageway for linear utilities or transportation uses.

Council on Environmental Quality (CEQ) – An advisory council to the President of the United States established by NEPA. This council reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

Counterpoise – Conductive cable buried in the ground at a transmission line tower to lower the resistance of the ground to conduct electricity.

Cretaceous – The final period of the Mesozoic era spanning the time between 145 and 65 million years ago.

Criteria pollutant – The 1970 amendments to the Clean Air Act required the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for certain pollutants known to be hazardous to human health. The EPA has identified and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen dioxide. The term “criteria pollutants” derives from the requirement that the EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

Critical habitat – Any particular range or habitat component that is the determining factor in a population’s ability to maintain and reproduce at a certain level over the long-term.

Crucial winter range – The portion of the winter range to which a wildlife species is confined during periods of heaviest snow cover.

Cultural resource – Any resource associated with the human cultural environment; examples include artifacts and historic artifacts, archaeological sites, historic sites, ethnographic sites; historic properties, and traditional cultural properties.

Cultural assemblage – The complete inventory of artifacts from a defined archaeological unit.

Cumulative effect – The effect on the environment that results from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7 and 1508.25). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7).

Current (electric) – A flow of electrons in an electrical conductor. The strength or rate of movement of the electricity is measured in amperes.

D

Deadend structure – Transmission line tower structures that are more robust than tangent structures, used (1) to add longitudinal strength to the line; (2) at turning points (angles); (3) for added safety at crossings of other utilities (e.g., other transmission lines and roads); and (4) to interrupt long distances of suspension structures that would otherwise provide more exposure to catastrophic line failure over long distances.

Debitage – The waste material produced during the production of chipped stone tools.

Decision-maker – The agency official who has been delegated authority to approve an action and is responsible for issuing a decision to implement a proposed action. Synonyms include authorized official, authorized officer, responsible official, and responsible manager.

Degradation – The wearing down, or away, and general lowering or reduction of the earth’s surface by the processes of weathering and erosion.

Demand (electric) – The rate at which electric energy is delivered to or by a system, part of a system or piece of equipment, at a given instant or averaged over any designated period of time.

***De minimis* levels –** The minimum threshold for which a conformity determination must be performed, for various criteria pollutants in various areas.

Dendroglyph – A design or motif carved with a sharp element into the trunk of living trees.

Design features of the Proposed Action – Measures or procedures incorporated into the proposed action or an alternative implemented as standard practice, including measures or procedures that could reduce or avoid adverse impacts. Because these features are built into the proposed action or alternative, design features are not considered mitigation.

Designated utility (or right-of-way) corridor – A parcel of land with specific boundaries identified by law, Secretarial Order, the land-use planning process, or other management decision as being a preferred location of existing and future rights-of-way. The corridor may be suitable to accommodate more than one type of right-of-way or one or more rights-of-way that are similar, identical, or compatible.

Direct current (DC) – The flow of electric charge is only in one direction. (In alternative current [AC], the flow of electric charge periodically reverses direction.)

Direct effect – Effects caused by the action (i.e., construction) and occur at the same time and place (40 CFR 1508.8(a).

Discharge (water) – The rate of flow or volume of water flowing in a stream at a given location or within a given period of time.

Dispersed recreation – Recreation activities of an unstructured type that are not confined to specific locations such as recreation sites. An example of these activities may be hunting, fishing, off-highway vehicle use, hiking, and sightseeing.

Distance zone – A visibility threshold distance where visual perception changes. The zones are usually defined as foreground, middleground, and background.

Distributed generation – A method of generating electricity from multiple small energy sources very near to where the electricity is actually used.

Distribution system – The portion of an electric system that is dedicated to delivering electric energy to an end user.

Diversity – The relative abundance of wildlife species, plant species, communities, habitat, or habitat features per unit of area.

Drive and crush – Driving overland within a staked overland access route. The landscape is not altered other than compaction of soil under the vehicle tires/tracks, and the vegetation may be crushed but not cleared or uprooted.

Dump – A formal or informal concentration of historic trash; related to subsistence practices and containing single or multiple episodes of deposition.

E

Ecology – The relationship between living organisms and their environment.

Economic base – An area’s economic base comprises industries that are primarily responsible for bringing outside income into the local economy. Economic base analysis measures the relative importance of industries for a particular area by comparing employment and income levels to a reference area (e.g., the United States).

Ecosystem – A complex system composed of a community of plants and animals and includes the system’s chemical and physical environment.

Effect – Impact on the human environment brought about by an agent of change or action. Effects analysis predicts the degree to which the environment will be affected by an action. The CEQ uses the terms effect and impact synonymously in the NEPA regulations. Other synonyms include consequence, result, and outcome. Effects can be beneficial or detrimental, and may be direct, indirect, or cumulative.

Electric and magnetic field (EMF) – A space or region within which magnetic forces are present around an electrical current (also referred to as electromagnetic field).

Electric field – Electric effect resulting from the voltage on a transmission line. Measured as volts per meter or kilovolts per meter.

Emergent (vegetation) – Vegetation with all or part of their vegetative and reproductive parts above the water.

Endangered species – A plant or animal species whose prospects for survival and reproduction are in immediate jeopardy, as designated by the Secretary of the Interior. It is further defined by the Endangered Species Act of 1973 (ESA), as amended.

Endemic – Plants or animals native to a particular region or country.

Environment – The surrounding conditions, influences, or forces that affect or modify an organism or an ecological community and ultimately determine its form and survival.

Environmental Impact Statement (EIS) – A detailed written statement, as required by Section 102(2)(C) of NEPA, when an agency proposes a major federal action significantly affecting the quality of the human environment.

Environmental justice – The pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, and/or socioeconomic status. Federal agencies must incorporate environmental justice as part of their mission by identifying and addressing the effects of programs, policies, and activities to ensure the opportunity for full and fair participation by affected communities in the decision-making process and avoid, minimize, or mitigate disproportionately high and adverse health and environmental effects on minority and low-income populations.

Eocene – The epoch of the Tertiary period spanning the time between 56 and 33.9 million years ago.

Eolian – Wind-blown sand or silt material, which when deposited forms dunes or small sandy ridges.

Ephemeral – Present only during a portion of the year. Generally refers to water courses.

Erosion – The wearing away of the land surface by running water, wind, ice, or other geological agents.

Escarpment – A steep slope or cliff formed by erosion or, less often, by faulting.

Exclusion area – An area identified through land-use plans or in the process of designating corridors for which rights-of-way are to be excluded.

Ethnography – The study and systematic recording of human cultures. Also the descriptive body of work produced from such research.

Extirpate – To destroy completely.

Extraction – The act of extracting or drawing a substance out of the earth (e.g., mining).

F

Fault – A fracture or fracture zone in the earth's surface along where there has been displacement of the sides, relative to one another and parallel to the fracture.

Fauna – The wildlife or animals of a specified region or time.

Feature – A complex artifact or part of a site such as a thermal feature, soil stain, depression, rock alignment, or activity area.

Federal Energy Regulatory Commission (FERC) – The agency primarily responsible for ensuring adequate energy supplies at just and reasonable rates and providing regulatory incentives for increased productivity, efficiency, and competition.

Federal land – All lands owned by the United States except land (1) in the National Park System, (2) held in trust for an Indian or Indian tribe, or (3) on the Outer Continental Shelf.

Federal Land Policy and Management Act of 1976 (FLPMA) – Public Law 94-579 of October 21, 1976. This law is often referred to as the BLM's Organic Act, which provides the majority of the BLM's legislated authority, direction, policy, and basic management guidance.

***Federal Register* –** The official daily publication for rules, proposed rules, and notices of federal agencies and organizations, as well as executive orders and other presidential documents. The *Federal Register* is published by the Office of the Federal Register, National Archives and Records Administration.

Fire-cracked rock – Rock which has been discolored, cracked, or altered by exposure to fire.

Fishery – The complex of interactions within and between the population(s) of fish being harvested, the population(s) or anglers, and the environment of each.

Floodplain – The portion of a river or stream valley, adjacent to the river channel, which is built of sediments and inundated with water when the stream overflows its banks.

Forage – All browse and herbaceous foods available to grazing animals that may be grazed or harvested for feeding.

Foreground – The visible area from a viewpoint or use area out to a distance of 0.5 mile. The ability to perceive detail in a landscape is greatest in this zone.

Foreground-middleground – The area visible from a travel route, residence, or other use area to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where texture and form of individual plants are no longer apparent in the landscape. Vegetation is apparent only in patterns or outline.

Fossil – The remains or traces of an organism or assemblage of organisms preserved by natural processes in the earth's crust; exclusive of organisms buried since the beginning of historical time.

Fuels management – Fuels are vegetation (alive or dead) that can carry fire. Management of fuels includes attempting to modify fire behavior should a wildland fire occur.

Fugitive dust – Dust put into the atmosphere by the wind blowing over plowed fields, dirt roads, or desert or sandy areas with little or no vegetation. Also caused by mechanically generated particulate matter emissions put into the air by reason of vehicles or equipment moving soil or driving over unpaved roads (or dirty paved roads) and dusty areas.

G

Gauss – Measurement of the magnetic flux intensity (intensity of magnetic field attraction per unit area).

Generation source – Generating facilities convert various forms of energy into electric power.

Genus – One of the major taxonomic groups used to scientifically identify plants or animals. Several closely related species, or one species, make up one genus, while several genera or one genus make up a family.

Geologic formations – A rock unit distinguished from adjacent deposits by some common character, such as its composition, origin, or the type of fossil associated with the unit.

Geology – The science that relates to the earth, the rocks of which it is composed, and the changes the earth has undergone or is undergoing.

Geothermal resource – Heat found in rocks and fluids at various depths that can be extracted by drilling or pumping for use as an energy source. This heat may be residual heat, friction heat, or a result of radioactive decay.

Grant – Any authorization or instrument (e.g., easement, ease, license, or permit) the BLM issues under Title V of the FLPMA, 43 U.S.C. 1761 et seq. The term includes those authorizations and instruments the BLM and its predecessors issued for like purposes before October 21, 1976, under the existing statutory authority. It also includes any authorization or instrument the BLM issues pursuant to other right-of-way authorities such as the Act or March 3, 1891 (43 U.S.C. 946-951) as to other than public and national forest land. It does not include authorizations issued under the Mineral Leasing Act (30 U.S.C. 185).

Grassland Reserve Program – A program administered by the U.S. Department of Agriculture Natural Resources Conservation Services and Farm Service Agency that provides financial assistance to landowners and operators to protect eligible grazing lands by voluntarily limiting future development and crop uses on the lands. (Food Security Act of 1985)

Grid – A transmission grid is a network of high-voltage, long-distance transmission lines and substations that connect generating facilities to distribution systems.

Ground wire – Two wires installed along the transmission line at the top of the tower structures to protect the conductors from lightning strikes by transferring the energy from the lightning through the ground wires and structures into the ground below.

H

Habitat – The region where a plant or animal naturally grows or lives. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and home range.

Habitat fragmentation – A reduction in area of undisturbed, continuous habitat. Often affects interior forest species that depend on unbroken expanses of mature coniferous forest.

Habitation – A site inhabited or used intensively over an extended period of time, either year-round or on a seasonal basis. Habitations are frequently characterized by multiple activity areas, extensive and diverse scatters of lithic debitage and specialized tools, ceramics, architectural remains, storage structures, thermal features, and well-developed middens.

Habitat obligate – Species that is limited in its habitat to a few specific environmental conditions

Hazardous air pollutants (HAP) – Air pollutants not covered by ambient air quality standards, but may present a threat of adverse human health effects or adverse environmental effects, specifically pollutants listed in Section 112(b) of the federal Clean Air Act.

Herbaceous – Of, or having the nature of, an herb or herbs, as distinguished from woody plants.

Herd Management Area (HMA) – An area that has been designated for continuing management of wild horses.

Historic property – Any district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) (maintained by the Secretary of the Interior [36 CFR 800]).

Human Environment – Includes the natural and physical environment and the relationship of people with that environment.

I

Impact – See *Effect*

Implementation plan – A site-specific plan written to implement decisions made in a land-use plan. An implementation plan usually selects and applies best-management practices to meet land-use-plan objectives.

Indian Tribe – See *American Indian Tribe*

Indirect effect – Caused by the action later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth-rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8(b)).

Indirect impact –See In*direct effect*

In-kind (as it relates to mitigation) – In-kind mitigation is the replacement or substitution of resources or values of the same type and kind as those affected (e.g., greater sage-grouse winter habitat is lost, and greater sage-grouse winter habitat is enhanced or conserved).

Instruction Memorandum – A memorandum containing policy or procedure.

Insulator – A device resistant to electrical conduction used for isolating and supporting conductors.

Interdisciplinary Team – See *Agency Interdisciplinary Team*

Interior Board of Land Appeals (IBLA) – The IBLA is an appellate review body that exercises the delegated authority of the Secretary of the Interior to issue final decisions for the Department of the

Interior. Its administrative judges decide appeals from bureau decisions relating to the use and disposition of public lands and their resources, mineral resources on the Outer Continental Shelf, and the conduct of surface coal mining operations under the Surface Mining Control and Reclamation Act. Located within the Department's Office of Hearings and Appeals, IBLA is separate and independent from the Bureaus and Offices whose decisions it reviews.

Intermittent – A river or stream that flows for a period of time, usually seasonally during rainy periods, and stops during dry periods. In arid regions, dry periods may be interrupted by occasional flash floods from brief but intense rain storms.

Invasive species – A species that is not native (or is alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm to human health (Executive Order 13112).

Inventoried roadless area – An area identified by the U.S. Forest Service (USFS) as undeveloped, typically exceeding 5,000 acres, that meets minimum criteria for wilderness consideration under the Wilderness Act and has been inventoried during the USFS Roadless Area Review and Evaluation (RARE II) process, subsequent assessments, or forest planning. These areas can overlap with unroaded/undeveloped areas.

Issue – An issue is a point or matter of discussion, debate, or dispute about the potential environmental effects of an action. Issues point to environmental effects and may influence the development of alternatives to the proposed action.

J

Jurassic – The middle period of the Mesozoic era spanning the time between 201.3 and 145 million years ago, characterized by the dominance of dinosaurs and the appearance of flying reptiles and birds.

Jurisdictions – The limits or territory within which authority may be exercised.

K

Kcmil – Abbreviation for a thousand circular mils. Kcmil is a unit used to express large conductor sizes.

Kiln – A thermally insulated structure used for firing, burning, hardening, or drying materials.

Kilovolt (kV) – A kilovolt is equal to 1,000 volts. This unit of measurement is most commonly used when describing transmission and distribution lines.

Kilovolts per Meter (kV/m) – A unit measure of electric field strength.

L

Lacustrine – Lakes and ponds that have more than 2 acres in surface area.

Landform – A term used to describe the many types of land surfaces that exist as a result of geologic activity and weathering (e.g., plateaus, mountains, plains, and valleys).

Land and Resource Management Plan (LRMP) – A USFS land-use management plan that provides a framework for on-the-ground decision making, for integrated resource management, and for guiding project and activity decision making on a national forest, grassland, prairie, or other administrative unit.

Land Use Plan – A set of decisions that establish the direction for management of land within an administrative area, (pertaining to federal land, as prescribed under the planning provisions of FLPMA).

Lek – A traditional courtship-display area attended by male greater sage-grouse in or adjacent to sagebrush-dominated habitat. Designation of the site as a lek requires the observation of two or more male sage-grouse engaged in courtship displays. New leks must be confirmed by a survey conducted during the appropriate time of day and during the strutting season. Observation of signs of strutting also can be used to confirm a suspected lek.

Land and Water Conservation Fund Site (LWCF) – The National Park Service (NPS) provides matching grants to state and local governments for acquisition and development of public outdoor recreation areas and facilities. (Section 6(f)(3) of the LWCF Act)

Linear facility – Project or action with linear features such as roadways (i.e., interstates, state routes, minor roads, and off-highway vehicle routes), transmission and distribution line right-of-ways, federally designated utility corridors, existing highways (e.g., I-15, I-70, and I-80; U.S. Highways 6 and 40), pipelines, and railroads.

Link – A segment of an alternative route sharing common endpoints with adjacent links. Endpoints of a link are determined by the location of intersections with other segments (links) of other routes.

Lithics – A general term used to refer to chipped stone artifacts or debitage.

Lithic procurement area – An area from which raw materials were obtained and removed for lithic tool manufacture and refurbishing.

Lithology – The structure and composition of a rock formation and the study of rocks with the unaided eye or with little magnification.

Livestock Enclosure – Any roofed or unroofed structure designated to contain domestic animals. It may be constructed of any materials and incorporate natural features or vegetation as part of the enclosure.

Load (electric) – The amount of electric power delivered or required at any specific point or points on a system. The requirement originates at the energy-consuming equipment of the consumers.

LR2000 – A data base for land and mineral records of the BLM. It is used to retrieve individual data such as a case file serial page or to compile reports by case types or geographical location.

M

Megawatt (MW) – The generation of electricity is measured in megawatts; 1 MW equals 1,000 kilowatts or 1 million watts.

Magnetic field – Electric effect resulting from an electric current flowing in a conductor. Unit of measurement is a Gauss.

Mesozoic – An era of geologic time between the Paleozoic and the Cenozoic eras, spanning the time between 252.17 and 66 million years ago.

Metamorphic – A rock formed through metamorphism. Metamorphism is the change in the mineralogical, structural, or textural composition of rocks under intense heat and pressure (e.g., turning limestone into marble).

Migratory – Birds, animals, or people that migrate or move from one region or country to another.

Mineral resources – Any inorganic or organic substance occurring naturally in the earth that has a consistent and distinctive set of physical properties. Examples of mineral resources include coal, nickel, gold, silver, and copper.

Minimization (as it relates to mitigation) – Minimizing impacts by limiting the degree or magnitude of the action and its implementation (40 CFR 1508.20).

Miocene – The epoch of the Tertiary period spanning the time between 23.03 and 5.3 million years ago.

Mitigate – To alleviate, reduce, or render less intense or severe.

Mitigation – Measures or procedures that could reduce or avoid adverse impacts and have not been incorporated into the proposed action or an alternative. Mitigation can be applied to reduce or avoid adverse effects on the human environment.

Monitoring – Actions performed to ensure compliance with the terms, conditions, and stipulations of a grant or temporary-use permit.

Mound (structural) – A pile of material and sediments that probably represent the remains of a habitation structure.

Mudstone – A hardened sedimentary rock consisting of clay that is similar to shale but does not occur in distinct, bonded layers.

Multiple Use – Coordinated management of various surface and subsurface resources so that they are used in the combination that will best meet present and future needs.

N

National Ambient Air Quality Standards (NAAQS) – The Clean Air Act requires the EPA to set NAAQS (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards: (1) *Primary standards* set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly and (2) *Secondary standards* set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA Office of Air Quality Planning and Standards has set NAAQS for six principal pollutants, which are called criteria pollutants.

National conservation area – An area designated by Congress, generally, to conserve, protect, enhance, and properly manage the resources and values for which it was designated for the benefit and the enjoyment of present and future generations (BLM Manual 6220).

National Environmental Policy Act of 1969 (NEPA) – Public Law 91-190. An Act that encourages productive and enjoyable harmony between man and his environment, promotes efforts to prevent or eliminate damage to the environment and biosphere, stimulates the health and welfare of man, enriches the understanding or the ecological systems and natural resources important to the nation, and establishes the CEQ.

National Historic Preservation Act of 1966 (NHPA) – Public Law 89-665; 16 U.S.C. 470 et seq. A law authorizing the Secretary of the Interior to expand and maintain a National Register of Historic Places and directing federal agencies to take into account the effects of their actions on historic properties and provide the ACHP a reasonable opportunity to comment.

National monument – Area designated by the president of the United States by proclamation pursuant to the Antiquities Act of 1906 for the protection, restoration, or enhancement of the resources, objects, and values for which it was designated. (BLM Manual 6220)

National Register of Historic Places (NRHP) – A list of districts, sites, buildings, structures, and objects maintained by the NPS, each determined by NPS to be of historic, cultural, architectural, archaeological, or engineering significance at the local, state, or national level, established by the Historic Preservation Act of 1966.

Native American – A member of any of the aboriginal peoples of the western hemisphere, especially native peoples of the United States and its territories, including American Indians, Alaska Natives, Native Hawaiians, Chamorros, and American Samoans.

Native load customers – The wholesale and retail customers on whose behalf the transmission provider, by statute, franchise, regulatory requirement, or contracts, has undertaken an obligation to construct and operate the transmission provider’s system to meet the reliable electric needs of such customers.

Native species – A species that, other than as a result of an introduction, historically occurred or currently occurs in an ecosystem (Executive Order 13112).

Native vegetation – Natural vegetation originating in a certain region or country.

Nitrogen dioxide (NO_2) – The result of nitric oxide (a gas formed by combustion and a precursor of ground-level ozone pollution, also known as smog) combining with oxygen in the atmosphere and a major component of photochemical smog. One of the six criteria pollutants.

Nitrogen oxides (NO_x) – Product of combustion from transportation and stationary sources consisting of a mixture of nitrogen and oxygen compounds, including nitric oxide and nitrogen dioxide.

Node – The common endpoint of adjacent links.

Nonattainment area – Area that does not meet one or more of the National Ambient Air Quality Standards for the criteria pollutants designated in the Clean Air Act.

Nonspecular conductors – Conductors treated to reduce reflection, rendering the conductor less shiny and noticeable.

Non-wilderness study area lands (WSA) with wilderness characteristics – Those lands that have been inventoried and determined by the BLM to contain wilderness characteristics as defined in Section 2(c) of the Wilderness Act of 1964, 16 U.S.C. 1131, et seq. These attributes include the area's size, its apparent naturalness, and outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Notice of availability (NOA) – The *Federal Register* notice that an EIS (draft or final) or record of decision (ROD) is available. Publication of a notice of filing of an EIS by the EPA formally begins the public comment period.

Notice of intent (NOI) – This *Federal Register* notice announcing that an EIS or an EA-level land-use plan will be prepared. Public of this notice formally starts the scoping process.

Notice to proceed – A written authorization by the Authorized Officer that allows the holder to initiate actions under the grant. A notice to proceed usually is used to allow a grant to be issued, while preventing the holder from starting surface-disturbing activities before a plan of development (POD) is approved. The Authorized Officer can issue separate notices to proceed if the project involves distinct work phases and/or locations. Each notice to proceed will specify the nature of the work, location, and dates to be authorized.

Noxious weed – A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or non-native, new, or not common to the United States.

O

Oligocene – The epoch of the Tertiary period spanning the time between 33.7 and 23.8 million years ago.

100-year flood – A flood with a magnitude that may occur once every 100 years. A 1-in-100 chance of a certain area being inundated during any year.

Occupied lek – A lek that has been active during at least one strutting season within the last 10 years. Management protection will be afforded to occupied leks.

Opportunity – Areas of opportunities for siting a transmission line; typically include linear features such as existing and future overhead lines, designated utility corridors, existing interstate and intrastate highways, pipelines, and railroads and areas where there are no environmental constraints precluding access to or siting of structures or facilities.

Out-of-kind (as it relates to mitigation) – Out-of-kind is the replacement or substitution of resources or values that are not the same type and kind as those affected but are related or similar (e.g., greater sage-grouse winter habitat is lost, but new greater sage-grouse nesting habitat is enhanced or conserved).

Outage – The period during which a generating unit, transmission line, or other facility is out of service.

Ozone (O_3) – A form of oxygen produced when an electric spark is passed through oxygen or air. One of six criteria pollutants.

P

Paleocene – The first geologic epoch of the Cenozoic Era covering the time between 66 and 56 million years ago. This is the era immediately following the extinction of the dinosaurs.

Paleontology – The science that deals with the life of past geological ages through the study of the fossil remains of organisms.

Paleontological resources – Any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth.

Paleozoic – The geologic era between the Precambrian and Mesozoic eras covering the time between 541 million and 252.17 million years ago. The era was characterized by the development of the first fish, amphibians, reptiles, and land plants.

Palustrine – A marsh or marsh-like environment.

Particulate Matter – Minute, separate particles, such as dust or other air pollutants. PM_{10} is a measure of particles in the atmosphere with a diameter of less than, or equal to, a nominal 10 micrometers aerodynamic equivalent diameter. $PM_{2.5}$ is a measure of particles in the atmosphere with a diameter of less than, or equal to, a nominal 2.5 micrometers aerodynamic equivalent diameter. These are criteria pollutants.

Peak demand – The maximum load during a specified period of time.

Per capita income – Calculated by dividing total income in a specified area (e.g., county) by the area's population.

Perennial – Lasting or active through the whole year. May refer to rivers, streams, or plants.

Petroglyph – A design or motif pecked, incised, abraded, scratched, or carved with a sharp element into a rock surface.

Physiographic province – An area characterized by distinctive topography, geologic structure, climate, drainage patterns, and other features and phenomena of nature.

Pictograph – A design or motif produced by painting with mineral pigments on a rock surface; painted rock art.

Pithouse – A habitation structure built entirely or partially underground.

Plan of Development (POD) – A complete description of and design for the proposed project. It includes, but is not limited to, proposed plans, specifications, construction methods, schedules, restoration practices, and other information pertinent to the proposal; the POD becomes part of the right-of-way grant or permit. The POD can include sections for construction, maintenance, and termination. The content of the POD will vary with the complexity of the proposal.

Plateau – An elevated tract of relatively level land, such as a tableland or mesa.

Playa – The shallow central basin of a desert plain where water gathers after a rain and is evaporated.

Pleistocene – The first geologic epoch during the Quaternary period, spanning from 2.6 million years ago to about 9000 Before Present, characterized by extensive continental glaciations in the Northern Hemisphere.

Policy – A guiding principle on which a specific decision or set of decisions is based.

Population – A group of organisms, all of the same species, which occupies a particular area. The term is used to refer to the number of individuals of a species within an ecosystem or of any group of like individuals.

Potential Fossil Yield Classification (PFYC) – A system of classification by which geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher potential. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level. The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classes that serve as guidelines for identifying potential for a formation to yield fossils include Class 1 – Very Low, Class 2 – Low, Class 3 – Moderate or Unknown, Class 4 High, and Class 5 – Very High.

Power – A term usually meant to imply both energy and capacity.

Precambrian – The earliest geologic era covering all time from the formation of the earth and ending at the Paleozoic Era, which began about 541 million years ago.

Preferred Alternative – The alternative believed to reasonably accomplish the purpose and need for the proposed action while fulfilling the statutory missions and responsibilities, giving consideration to economic, environmental, technical, and other factors. This alternative may or may not be the same as the applicant's preferred alternative.

Primitive – An area that is not developed; a pristine natural area.

Project area – The preliminary study area defined to examine all feasible siting corridors for the Project. Established by the Applicant's interest and objectives for the Project, the Project description, and other siting criteria such as potential major substation interconnect points, existing designated utility corridors, existing extra-high-voltage transmission lines, geography, and land-use designations (e.g., National Parks, wilderness areas).

Proposal – The stage in the development of an action when a federal agency has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal and the effects can be meaningfully evaluated (40 FR 1508.23). When a federal agency receives or makes a proposal, the NEPA process begins.

Proposed Action – A proposal for a federal agency to authorize, recommend, or implement an action to address a clear purpose and need. Alternatives are developed to consider different reasonable paths to take to accomplish the same purpose and need of the proposed action.

Protest – An opportunity for a qualified party to seek an administrative review of a proposed decision in accordance with program-specific regulations. For example, a protest may be filed with the Director of the BLM for review of a proposed resource management plan or plan amendment (43 CFR 1610.5-2), or a proposed grazing decision may be protested for review by the Authorized officer (43 CFR 4160.2).

Public land (FLPMA) – Any land and interest in land owned by the United States within the several states and administered by the Secretary of the Interior through the BLM without regards to how the United States acquired ownership except (1) land located on the Outer Continental Shelf and (2) land held for the benefit of Indians, Aleuts, and Eskimos.

Public land (other) – As used in this document, federally owned surface or mineral estate specifically administered by the BLM.

Q

Quarry – An area from which rock or minerals (e.g., ore, limestone, coal, gravel, and sand pits) have been excavated and extracted for use off-site.

Quaternary – The second period of the Cenozoic era spanning 1.8 (recently refined to 2.6) million years ago to the present. This is the period of glaciations in the northern hemisphere.

Quaternary fault – A fault that has been active or has had displacement during the Quaternary Period, between 1.8 million years ago and the present. These faults are most likely to be active on human time scales.

R

Raptor – A bird of prey.

Reclamation – Returning disturbed lands to a form and productivity that will be ecologically balanced.

Reconnaissance – Preliminary examination or survey of a territory.

Recontouring – Returning a surface to, or near to, its original form through some type of action, such as grading.

Record of decision (ROD) – A document separate from, but associated with, an EIS that publicly and officially discloses the responsible official's decision on the proposed action.

Recreation opportunity spectrum (ROS) – A planning process that provides a framework for defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for experiences are arranged along a continuum or spectrum of classes. The resulting analysis defines specific geographic areas on the ground, each of which encompasses one of the classes.

Rectify (as it relates to mitigation) – Rectifying the impact by repairing, rehabilitating, or restoring the affected environment (40 CFR 1508.20).

Reduce or eliminate over time (as it relates to mitigation) – Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action (40 CFR 1508.20).

Reference centerline – For purposes of assessing impacts and recommending mitigation, a centerline is assigned that may be slightly adjusted during engineering design.

Region – A large tract of land generally recognized as having similar character types and physiographic types.

Renewable resource – Any natural resource that can replenish itself naturally over time.

Research natural area – A part of a national network of ecological areas designated in perpetuity for research and education and/or to maintain biological diversity of National Forest System lands. Research Natural Areas are principally for nonmanipulative research, observation, and study. (Forest Service Manual-4063)

Residual impact – Those impacts remaining after mitigation has been applied to the proposed action or an alternative.

Reasonably foreseeable future action (RFFA) – Actions for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends.

Resource management plan – A set of decisions that establish the direction for management of land in an administrative area, in this case, land administered by the BLM, as prescribed under the planning provisions of the FLPMA, as amended, P.L. 94-579, 90 Stat. 2743.

Revegetation – The reestablishment and development of self-sustaining plant cover. On disturbed sites, this normally requires human assistance, such as reseeding.

Rhizomatous – Having a long underground stem system that cannot be viewed aboveground and which may disintegrate over time

Right-of-way – A permit or grant that authorizes the use of lands or certain specified purposes, commonly for pipelines, roads, telephone lines, electric transmission lines, reservoirs, etc.; also, the land covered by such a permit or grant.

Riparian – A transition between wetlands or water bodies and upland areas. An aquatic or terrestrial ecosystem associated with bodies of water, such as streams, lakes, or wetlands, or is dependent on the existence of perennial, intermittent, or ephemeral surface or subsurface water drainage. Riparian areas are usually characterized by dense vegetation and an abundance and diversity of wildlife.

Rock art – Inclusive term referring to both pictographs and petroglyphs

Route – A transmission route is the general path of a transmission line and associated facilities.

S

Sandstone – A common sedimentary rock primarily composed of sand grains, mainly quartz cemented together by other minerals.

Scenic backway – A paved or dirt road reaching secluded areas of natural beauty.

Scenic byway – A specially designated road that travels through an area of natural beauty.

Scenic quality – The visual appeal of a tract of land based on landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications in relationship to the natural landscape.

Scenic Quality Rating Unit (SQRU) – A portion of the landscape that displays primarily homogeneous visual characteristics of the basic landscape features (landform, water, vegetation, and structures and modifications), which separate it from the surrounding landscape.

Sediment – Solid fragmental material, either mineral or organic, transported or deposited by air, water, gravity, or ice.

Segment – A combination of links.

Selective mitigation – Measures or techniques developed to reduce adverse impacts on a case-by-case or selective basis.

Semi-arid – A climate or region characterized by little yearly rainfall and the growth of a number of short grasses and shrubs.

Sensitivity – The state of being readily affected by the actions of external influence.

Sensitivity Level Rating Unit (SLRU) – The designation (high, medium, or low) assigned to a landscape area to indicate the concern of the public to changes in the landscape (BLM designation).

Series compensation station – Facility that improve the transport capacity and efficiency of the transmission line.

Shield wire – See *Ground wire*

Significant impact – Effects of sufficient context and intensity that an EIS is required. The Council on Environmental Quality regulations at 40 CFR 1508.27(b) include ten considerations for evaluating intensity.

Simulations – The use of a computer to calculate the effect of a given physical process.

Site – In general, a compact area, usually involving nonlinear facilities (e.g., substation, series compensation station). In archaeology, any locale showing evidence of human activity.

Special recreation management area (SRMA) – An administrative unit where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially as compared to other areas used for recreation.

Special recreation use permit – An authorization which allows for recreation uses of the public lands and related waters. It is issued as a means to control visitor use, protect recreational and natural resources, and provide for the health and safety of visitors. (BLM Handbook H-2930-1)

Species – A group of individuals of common ancestry that closely resemble each other structurally and physiologically and in nature interbreed, producing fertile offspring.

Spanning – Placing tower structures so the transmission line extends across a sensitive area or resource

Spring – A place where groundwater flows naturally onto the land surface, often the source of a stream.

Staging Area – A designated area where vehicles, supplies, and construction equipment are positioned for use and access to a construction site.

Stipulation – A condition, requirement, or term specified in a grant.

Structures – Structures support transmission lines. Structures are different sizes and shapes depending on the voltage of the line and number of circuits each tower structure needs to carry.

Study area – A given geographical area delineated for specific research.

Study corridor – The area of study (i.e., resource inventory and effects analysis) for a particular resource determined by the Agency Interdisciplinary Team; varies for each resource based on the area that potentially could be affected.

Subspecies – Any natural subdivision of a species that exhibits small, but persistent morphological variations from other subdivisions of the same species living in different geographical regions or times.

Substantive comment – A comment that does one or more of the following: (1) questions, with reasonable basis, the accuracy of information in the EIS or EA; (2) questions, with reasonable basis or facts, the adequacy of, methodology for, or assumptions used for the environmental analysis; (3) presents reasonable alternatives other than those presented in the EIS or EA; or (4) promotes the lead agency to consider changes or revisions in one or more of the alternatives.

Substation – An electrical power station that is the connection point between transmission and distribution systems. Substations house the equipment used to route, control, and protect the flow of power in the electrical system. It also is a facility in an electrical transmission system with the capability to transform power to a higher or lower voltage. Equipment includes transformers, circuit breakers, and other equipment for switching, changing, or regulating the voltage of electricity.

Substrates – Sediment that lies beneath the surface of the earth.

Sulfur dioxide (SO_2) – A pungent, colorless, gas formed primarily by the combustion of fossil fuels. One of the six criteria pollutants.

Sweathouse – An enclosure or hut used for steam baths, usually ephemeral in construction.

Synergistic – Interaction of conditions such that the total effect is greater than the sum of the individual effects.

T

Take – As defined by the ESA, “to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or attempt to engage in any such conduct.”

Talus – A pile of rock debris at the foot of a cliff or steep slope.

Tangent Structure – Typical transmission line structure. Can be one of several types placed four to five per mile in linear position.

Taxonomy – A system of arranging animals and plants into natural, related groups based on some factor common to each, such as structure or biochemistry.

Technical Report – Documentation of detailed studies summarized in the Draft EIS.

Temporary-use permit – A document the BLM issues under 30 U.S.C. 185 that is a revocable, nonpossessory privilege to use specified federal land in the vicinity of, and in connection with a right-of-way to construct, operate, maintain, or terminate a pipeline to protect the environment or public safety. It does not convey any interest in land.

Tepee – A temporary, tripod or conical habitation structure constructed of elk or buffalo hide, cut limbs, grass, brush, or bark overlaying a frame.

Tertiary – The first period of the Cenozoic era (after the Mesozoic era and before the Quaternary period), spanning the time period between 66 and 2.6 million years ago.

Thermal eature – A localized area of controlled intentional burning. Includes fire pits, fire rings, burned rock rings, and slab-lined hearths.

Third-party contracting – Contracting for the preparation of NEPA documents that is funded by the non-federal proponent of an action. The federal agency must provide the direction for preparing the NEPA document and must approve the analysis and document.

Threatened Species – Any plant or animal species defined under the ESA as likely to become endangered in the foreseeable future throughout a significant portion or all of its range; listings are published in the *Federal Register*.

Traditional Cultural Property (TCP) – Any built or natural locations, areas, or features considered sacred or culturally significant by a group or people because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history and (b) are important in maintaining the continuing cultural identity of the community.

Transmission – The movement or transfer of electric energy over an interconnected group of line and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transmission Line – Transmission lines connect the power produced at generating facilities to substations. Over long distances, it is most effective to transport electricity at high voltages.

Transmission System – An interconnected group of electric transmission lines and associated equipment for moving or transferring electric energy in bulk between point of supply and points at which it is transformed for delivery over the distribution system lines to consumers, or is delivered to other electric systems.

Triassic – The first period of the Mesozoic era spanning the time between 252.17 and 201.3 million years ago, characterized by the first appearance of dinosaurs and mammals.

Tributary – A stream or river that flows into a larger stream or river.

U

Unauthorized use – The use, occupancy, or development of the public land without authorization or using, occupying, and developing them in a way that is beyond the scope and terms and conditions of an authorization. It includes acts or omissions causing undue or unnecessary degradation to the occupied public land.

Unemployment – Persons are classified as unemployed if they do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work. Persons who were not working and were waiting to be recalled to a job from which they had been temporarily laid off are also included as unemployed. The unemployment rate represents the number unemployed as a percent of the labor force.

Ungulate – A hoofed typically herbivorous quadruped mammal.

Unroaded/undeveloped area – An area identified by the USFS containing wilderness qualities or attributes and roadless qualities pursuant to the National Forest System Land Resource Management Planning Rule of 1982. These areas can overlap with inventoried roadless areas.

Uranium – A very hard, heavy, silvery, metallic, chemical element that is crucial to the research and development of atomic energy.

V

Vegetation communities – A combination of dominant plant species that live together in the same region or on the same landform.

Vegetation clearing – Clearing of vegetation in the Project right-of-way prior to Project construction.

Viewshed – Visible portion of the specific landscape seen from a specific viewpoint, normally limited by landform, vegetation, distance, and existing cultural modifications.

Visual management objectives – The term used in this study to generally define Visual Resource Management (BLM) or Visual Quality Objectives (USFS).

Visual resource – Visible feature of the landscape, such as land, water, vegetation, and other features that make up the scenery of an area.

Visual resource inventory (VRI) classes – Classification of landscape areas composed of scenic quality, sensitivity level rating units (SLRU), and distance zones for inventory purposes (BLM).

Visual resource management (VRM) classes – Classification of landscapes according to the kinds of structures and changes acceptable to meet established visual goals (BLM).

Visual management system (VMS) – System to inventory existing scenic values and to manage USFS-administered lands based upon meeting visual management goals (USFS).

Visual quality objectives (VQO) – Classification of landscapes to set an acceptable level of alteration from the natural landscape (USFS).

Volatile organic compound (VOC) – Any organic compound that participates in atmospheric photochemical reactions except those designated by the EPA as having negligible photochemical reactivity.

Volt – A measure of electrical potential difference that would cause a current of ampere to flow through a conductor whose resistance is 1 ohm.

Volts per meter – A unit of measurement of an electric field.

W

Waters of the United States – All waters currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including adjacent wetlands and tributaries to waters of the United States, and all waters by which the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce.

Watershed – All lands that are enclosed by a continuous hydrologic drainage divide and lay upslope from a specified point on a stream.

Watt – A unit of electrical power equal to 1/756 horsepower.

Wetlands – Those areas inundated by surface or groundwater with a frequency sufficient to support vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Wickiup – A temporary, dome-shaped habitation structure constructed of cut limbs, matting, reeds, reed matting, or bark overlaying a frame.

Wild and scenic river (WSR) – A system of nationally designated rivers and their immediate environments that have outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. Types of streams include flowing bodies of water or estuaries or a section, portion, or tributary thereof, including rivers, streams, creeks, runs, kills, rills, and small lakes. The system consists of three types of streams: (1) recreation—rivers or sections of rivers that are readily accessible by road or railroad and may have some development along their shorelines and may have undergone some impoundments or diversion in the past; (2) scenic—rivers or sections of rivers free from impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads; and (3) wild—rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted.

Wild horse herd management area (WHHMA) – A herd area that has been evaluated and determined by the BLM to have adequate food, water, cover, and space to sustain healthy and diverse wild horse and burro populations over the long-term (BLM Handbook H-4700-1).

Wilderness – A congressionally designated area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation that is protected and managed to preserve its natural conditions, as described in Section 2A of the Wilderness Act of 1964.

Wilderness characteristics – Characteristics of lands that include a lack of permanent human improvements or habitation, primeval character intact, affected primarily by the forces of nature, and/or presence of outstanding opportunities for solitude or a primitive and unconfined type of recreation.

Wilderness study area – A roadless area or island of undeveloped federal land inventoried and found to possess wilderness qualities or attributes described under Title VI, Section 603 of the FLPMA and Section 2C of the Wilderness Act of 1964. These characteristics include the following:

1. generally appears to have been affected mainly by the forces of nature, with human imprints substantially unnoticeable
2. has outstanding opportunities for solitude or a primitive and unconfined type of recreation

(3) has at least 5,000 acres or is large enough to make practicable its preservation and use in an unimpaired condition
(4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historic value

Wilderness qualities or attributes – Key qualities or attributes of wilderness listed in section 2(c) of the Wilderness Act of 1964 and used by BLM in conducting wilderness inventories. These characteristics are features of the land associated with the concept of wilderness that specifically deals with naturalness and opportunities for solitude and primitive and unconfined recreation. These characteristics may be considered in land use planning when BLM determines those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance), need (trend, risk), and practical to manage (from IM-2003-275, Change 1, Considerations of Wilderness Characteristics in Land Use Plan, Attachment 1).

Wildlife habitat management area (WHMA) – Special management areas that are designed to protect or preserve certain qualities or uses for wildlife and plant species. The environment in these areas is unique in some respects, and it is therefore desirable to apply to different management prescriptions to these areas from those of the surrounding public lands. The integration of different land-management goals, objectives, and actions will be implemented to ensure that the integrity of these areas will be maintained. They will be directed toward habitat management rather than species management and encompass featured species and species diversity to ensure compliance with existing laws prevent species from becoming threatened or endangered, and provide values and uses for the public.

Wind energy – Form of energy conversion in which turbines convert the kinetic energy of wind into mechanical or electrical energy that can be used for power.

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Appendix A
Applicant’s Interests and Objectives

APPENDIX A

PROJECT INTERESTS AND OBJECTIVES

GATEWAY SOUTH TRANSMISSION PROJECT

REQUEST FOR RIGHT OF WAY

October 14, 2014

PACIFICORP
A BERKSHIRE HATHAWAY ENERGY COMPANY

Who We Are:

Applicant Overview & History

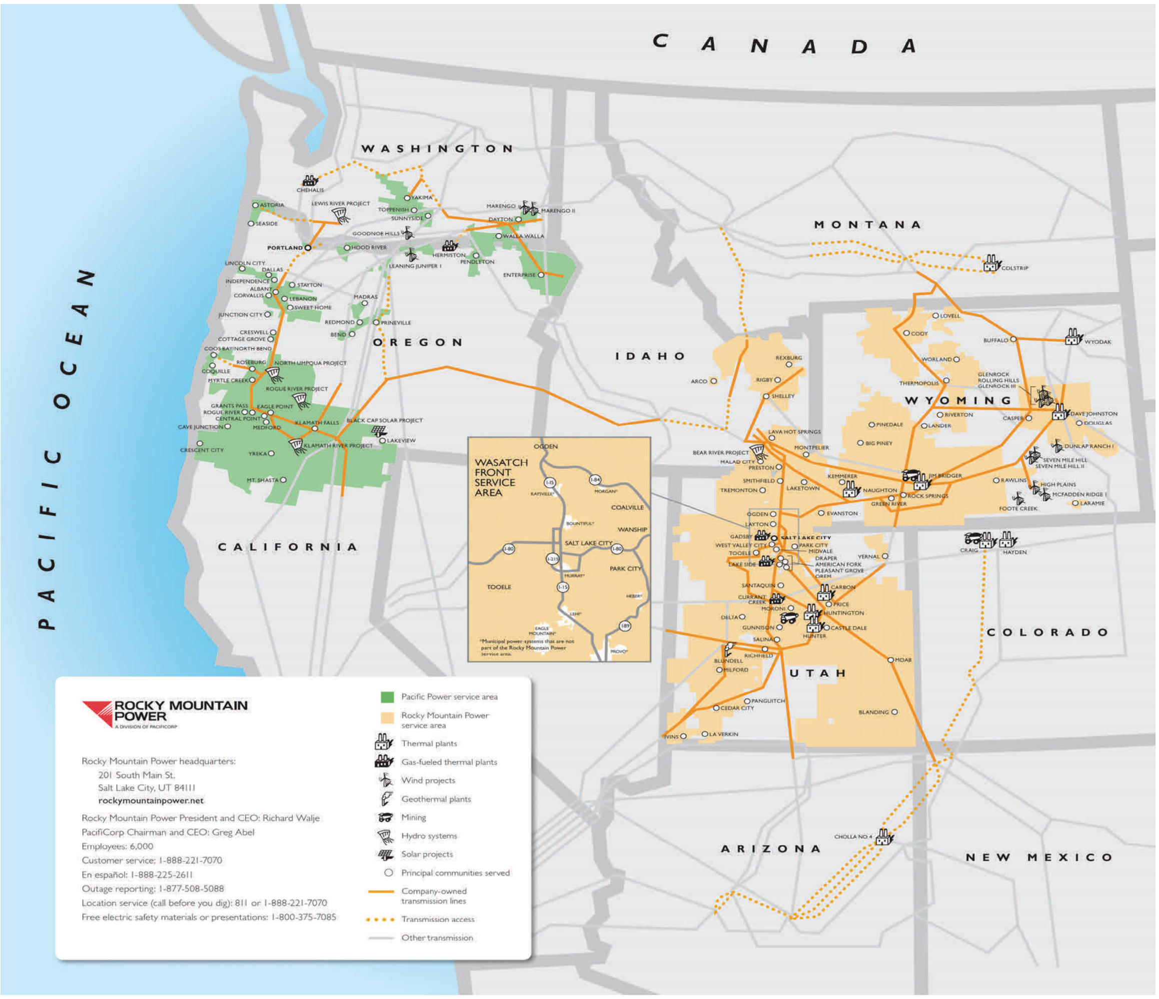
About PacifiCorp – An Overview

PacifiCorp, a Berkshire Hathaway Energy Company, is one of the West's leading utilities, serving more than 1.8 million customers across 136,000 square miles in six Western states. The Company consists of three business units, aggregating up to PacifiCorp: **PacifiCorp Energy**, containing the electric generation, commercial, energy trading and coal mining operations of the Company, is headquartered in Salt Lake City, Utah; **Pacific Power**, which delivers electricity to customers in Oregon, Washington and California, is headquartered in Portland, Oregon; and **Rocky Mountain Power**, which delivers electricity to customers in Utah, Wyoming and Idaho, is headquartered in Salt Lake City, Utah. PacifiCorp is headquartered in Portland, Oregon.

Rocky Mountain Power

Before the Company's name was changed in 2006, Rocky Mountain Power served customers in Utah and Idaho as Utah Power. Wyoming customers were served by Pacific Power, though some had been served earlier under the Utah Power name. Utah Power dates back to 1881, when Salt Lake City became the fifth city in the world to have central station electricity. Known then as Utah Power & Light (UP&L), the Company itself was formed in 1912 from several small electric companies in Utah, Idaho and western Colorado. In organizing dozens of small power companies, serving 130 small cities and towns, the new company supplied about 39,700 customers in 1912. In just 10 years, UP&L grew to serve 205 communities and 83,000 customers.

Historically, meeting the growing consumer and commercial needs for reliable, low-cost energy solutions is an ongoing focus for the Company, and thus, is the basis for this application.



About the Program:

Energy Gateway Transmission Expansion Program

Program Background -- Energy Gateway Transmission Expansion Program

PacifiCorp's large-scale transmission expansion program named the "Energy Gateway Transmission Expansion Program" consists of three principal parts: Gateway Central, Gateway West, and the proposed project, Gateway South. Gateway Central includes Populus to Terminal (135 miles of double-circuit 345kV placed in-service November 2010), Mona to Oquirrh (100 miles of single-circuit 500kV placed in-service May 2013), and Oquirrh to Terminal (14 miles of double-circuit 345kV scheduled to be in-service in 2017). Additionally, the Sigurd to Red Butte No. 2 project is 175 miles of single-circuit 345kV currently under construction with a scheduled in-service date of June 2015.

Energy Gateway's History & Evolution

Originally announced in May 2007, Energy Gateway consisted of a combination of single- and double-circuit 230kV, 345kV and 500kV lines connecting Wyoming, Idaho, Utah, Oregon, and Nevada.

The Energy Gateway Transmission Expansion Program is the result of years of ongoing local and regional transmission planning efforts with significant customer and stakeholder involvement. Since its announcement in May of 2007, Energy Gateway's scope of work and scale have continued to evolve to meet the changing needs of PacifiCorp customers, Federal, Regional, State, and Local regulations and standards.

While the core requirements for Energy Gateway's design have not changed, the project configuration and timing continue to be reviewed and modified to align with the latest mandatory transmission system reliability standards and performance requirements. Additionally, PacifiCorp reviews annual system reliability assessments, considers experience from years of federal and state permitting processes, assesses changing generation in resource planning in order to meet our customers' forecasted demand for energy.

Challenges to the Growth of the Energy Gateway Transmission Expansion Program

In response to regulatory and industry input regarding the benefits of "upsizing" the project capacity, PacifiCorp included in its original plan the potential for doubling the project's capacity to accommodate third-party and equity partnership interests. During late 2007 and early 2008, PacifiCorp received in excess of 6,000MW of requests for incremental transmission service across the Energy Gateway footprint — which validated the plan's upsized capacity configuration.

PacifiCorp identified the costs associated with this upsized system and offered transmission service contracts to potential interconnection customers, however these customers were unable to commit due to the upfront costs and lack of firm contracts with end-use customers to take delivery of future generation. Ultimately, these customers withdrew their requests, and PacifiCorp pursued several other potential partnerships in the Intermountain Region. Due to the significant upfront costs inherent in transmission investments, firm commitments and partnerships failed to materialize, leading PacifiCorp to pursue the current configuration with the intent of only developing system capacity sufficient to meet the long-term needs of its customers.

In 2011, PacifiCorp announced it would no longer pursue the 500kV segment between the Mona, UT substation and the Las Vegas (Crystal), NV substation. This extension of Gateway South Transmission Project was a component of the upsized system to address regional needs. However, despite the significant third-party interest in this segment, there was a lack of financial commitment needed to realize it.

In 2012, due to experience with land use limitations, National Environmental Policy Act permitting requirements and feedback from significant stakeholders, PacifiCorp eliminated one of the two new proposed 230kV lines between the Windstar, WY and Aeolus, WY substations. The best balance between cost and risk for customers resulted in one new 230kV line combined with a rebuild of the existing 230kV line.

During January of 2013, PacifiCorp began discussions with Portland General Electric (PGE) regarding changes to PGE's Cascade Crossing transmission project and potential opportunities for joint development and/or firm capacity rights into PacifiCorp's Oregon system. PacifiCorp had a Memorandum of Understanding (MOU) with PGE with respect to the development of Cascade Crossing that has subsequently terminated and further discussions with PGE about Cascade Crossing as an option for development ended. PacifiCorp continues to pursue potential partnership opportunities with other providers as alternatives to the originally proposed transmission segment.

About the Program:

Energy Gateway Transmission Expansion Program

Challenges to the Growth of the Energy Gateway Transmission Expansion Program (continued)

While permitting delays have played a significant role in the adjusted timing of some segments (e.g. Gateway West and Gateway South), with the exception of Populus to Terminal, PacifiCorp has been proactive in adjusting in-service dates due to permitting schedules, moderated load growth, changing customer needs, and system reliability improvements.

PacifiCorp will continue to adjust the timing, configuration and permitting activities of the proposed transmission investments based upon its ongoing assessment of the systems ability to meet customer needs and comply with mandatory reliability standards.

Energy Gateway's Continued Commitment to Excellence

The Energy Gateway Transmission Expansion Program continues to play an important role in PacifiCorp's commitment to provide safe, reliable, and reasonably priced electricity to meet the needs of our customers. The design and extensive footprint provide needed system reliability improvements and support the development of a diverse range of cost-effective resources for meeting customers' forecasted energy needs.

The Energy Gateway Transmission Expansion Program has been incorporated into the Integrated Resource Plan (IRP) public process since 2007 as part of the solution for delivering the least cost resource portfolio for multiple planning cycles. PacifiCorp continues to develop methods, in parallel with current industry best practices and regional transmission planning requirements, to better quantify all the benefits of transmission that are essential to serve customers. Energy Gateway is designed to relieve operating limitations, increase capacity, and improve operations and reliability in the existing electric transmission grid while providing access to cost effective resources.

Several Energy Gateway developments have occurred since PacifiCorp's 2013 Integrated Resource Plan (IRP) was filed. These developments include continued progress relative to construction and permitting milestones, adjusting in-service dates for future segments to better align with customer needs and ongoing efforts around potential joint-development projects.

Table 1, below, which is included in the 2013 IRP Action Plan update, provides a status update on In-Service Dates for each of the Energy Gateway segments.

Segment	2013 IRP	2013 IRP Update (published 2014)
Segment A: Wallula to McNary	2013-2014	Sponsor Driven*
Segment B: Populus to Terminal	N/A	Completed Nov 2010
Segment C: Mona to Oquirrh	N/A	Completed May 2013
Segment C: Oquirrh to Terminal	June 2016	May 2017*
Segment D: Windstar to Populus	2019-2021	2021-2024*
Segment E: Populus to Hemingway	2020-2023	2020-2024*
Segment F: Aeolus to Mona	2020-2022	2020-2022
Segment G: Sigurd to Red Butte	June 2015	June 2015
Segment H: West of Hemingway	No date	Sponsor Driven

***Table 1.** The Energy Gateway Segments and the forecasted IRP in-service dates.

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Why This Project is Needed:
Gateway South Transmission Project

Summarized Objectives of the Gateway South Transmission Project

PacifiCorp needs to make improvements to its bulk transmission network in order to transport electricity reliably from generation resources to various load centers. Additional transmission infrastructure is needed to:

- **Maintain compliance with mandated national reliability standards** that require PacifiCorp to have a plan to: "operate to supply projected customer demands and projected Firm Transmission Services, at all demand levels over the range of forecast system demands…."
- **Meet obligations and requirements** specifically required under PacifiCorp's Open Access Transmission Tariff (OATT) approved by the Federal Energy Regulatory Commission (FERC).
- Ensure customers have an **adequate supply of reliable and low–cost energy.**
- **Reliably deliver power** to continuously changing customer energy–supply demands under a wide variety of system–operating conditions.
- **Supply electrical demand and energy requirements of customers,** taking into account planned and unplanned system outages.
- Allow PacifiCorp to access energy available from existing markets and to **sell excess generation** to those existing markets when cost effective to customers.
- Support options for **generation resource development** including economically feasible renewable generation as specified in PacifiCorp's current and future Integrated Resource Plans**.**
- **Meet the current and anticipated 20 year energy supply requirements**, policies, rules and laws at the federal level and in the states that PacifiCorp serves.

In particular, the Gateway South Transmission Project is needed to fulfill the following key responsibilities of PacifiCorp:

- **Serve Native Load.** PacifiCorp is responsible for providing electric service to 1.8 million retail customers in the states of California, Idaho, Oregon, Utah, Washington, and Wyoming. PacifiCorp has a legal obligation to ensure sufficient firm point–to–point and network transmission capacity is available to meet the electric demands of all its customers now and into the future.
- **Serve Third–Party Network Customers.** In addition to providing service to its native load customers, PacifiCorp also is required to provide transmission service to its third–party network customers, which in turn directly serve their customers in these same states. PacifiCorp has a legal responsibility to provide reliable transmission service to third parties if transmission capacity is available.
- **Ensure Reliability.** The Gateway South Transmission Project is needed to fulfill PacifiCorp's requirement to provide reliable electrical service to all its customers based on the current and 20 year energy supply forecasts.
- **Access to Energy Resources.** PacifiCorp has a legal obligation to transport identified third–party network generation to serve network loads. The Gateway South Transmission Project is needed to provide PacifiCorp with access to rich and diverse generation resources throughout its service territory needed to meet the growing electrical demands of its customers. In general, expansion of the transmission system is needed to accommodate a variety of future resource scenarios and plans.
- **Maximize Infrastructure Benefits.** When interconnected to the wider electric system in the west, including Energy Gateway, the Gateway South Transmission Project would function as a fully interconnected electric system element in the west–wide electric grid and would be expected to carry its fully rated capacity (1,500MW of electrical power flow) across the system.

About the Proposed Project:

Gateway South Transmission Project

Project Background -- Gateway South Transmission Project

As a critical part of the Energy Gateway Transmission Expansion Program, PacifiCorp has designed the Gateway South Transmission Project, to deliver reliable electricity to more than a million retail customers in the service area of Rocky Mountain Power. Gateway South is a single-circuit 500kV facility alternating current (AC) transmission line that would run between existing, planned, and proposed substations. A proposed single-circuit 500-kilovolt (kV) transmission line approximately 400 miles in length would begin at the planned Aeolus Substation near Medicine Bow, Wyoming, connect to two separate proposed series compensation substations, and terminate at the existing Clover Substation near Mona, Utah.

Gateway South Transmission Project —Growth in Service Area and Increased Demand

Since 1996, within PacifiCorp's service area, employment levels have grown steadily. This growth coupled with an increase in per-customer electric usage has resulted in a sustained increase in the overall demand for electricity. As a result, the transmission system currently used to provide access to low-cost generating resources, including renewables and reliable service is now fully utilized.

The 2011 Integrated Resource Plan (IRP) indicated that while economic conditions have slowed, PacifiCorp's overall service territory has continued to grow in all segments, and forecasted an increase in energy usage across its system at an average of 2.3% per year over the next five years and by 2% each year over the next ten years.

In PacifiCorp's 2013 IRP update, PacifiCorp forecasts an increase in overall energy usage across its system at an average of 1.37% average annual growth over the next ten years. Currently, PacifiCorp has approximately 10,085MW of existing resources, and the ten-year plan forecasts a need of approximately 12,110MW by the year 2023. This is illustrated in Tables 3.1 and 3.2.

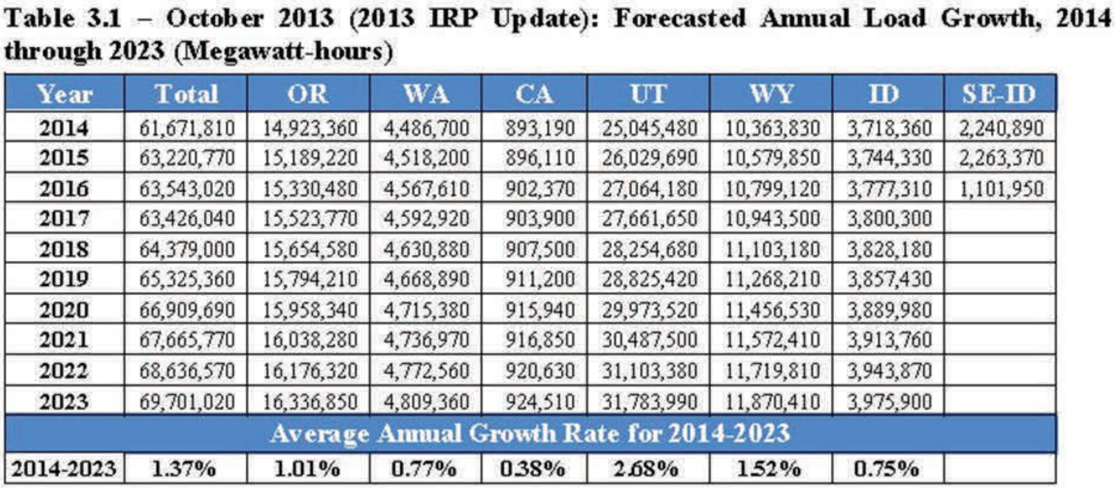


Table 3.1 – October 2013 (2013 IRP Update): Forecasted Annual Load Growth, 2014 through 2023 (Megawatt-hours)

Year	Total	OR	WA	CA	UT	WY	ID	SE-ID
2014	61,671,810	14,923,360	4,486,700	893,190	25,045,480	10,363,830	3,718,360	2,240,890
2015	63,220,770	15,189,220	4,518,200	896,110	26,029,690	10,579,850	3,744,330	2,263,370
2016	63,543,020	15,330,480	4,567,610	902,370	27,064,180	10,799,120	3,777,310	1,101,950
2017	63,426,040	15,523,770	4,592,920	903,900	27,661,650	10,943,500	3,800,300	
2018	64,379,000	15,654,580	4,630,880	907,500	28,254,680	11,103,180	3,828,180	
2019	65,325,360	15,794,210	4,668,890	911,200	28,825,420	11,268,210	3,857,430	
2020	66,909,690	15,958,340	4,715,380	915,940	29,973,520	11,456,530	3,889,980	
2021	67,665,770	16,038,280	4,736,970	916,850	30,487,500	11,572,410	3,913,760	
2022	68,636,570	16,176,320	4,772,560	920,630	31,103,380	11,719,810	3,943,870	
2023	69,701,020	16,336,850	4,809,360	924,510	31,783,990	11,870,410	3,975,900	
Average Annual Growth Rate for 2014-2023								
2014-2023	1.37%	1.01%	0.77%	0.38%	2.68%	1.52%	0.75%	

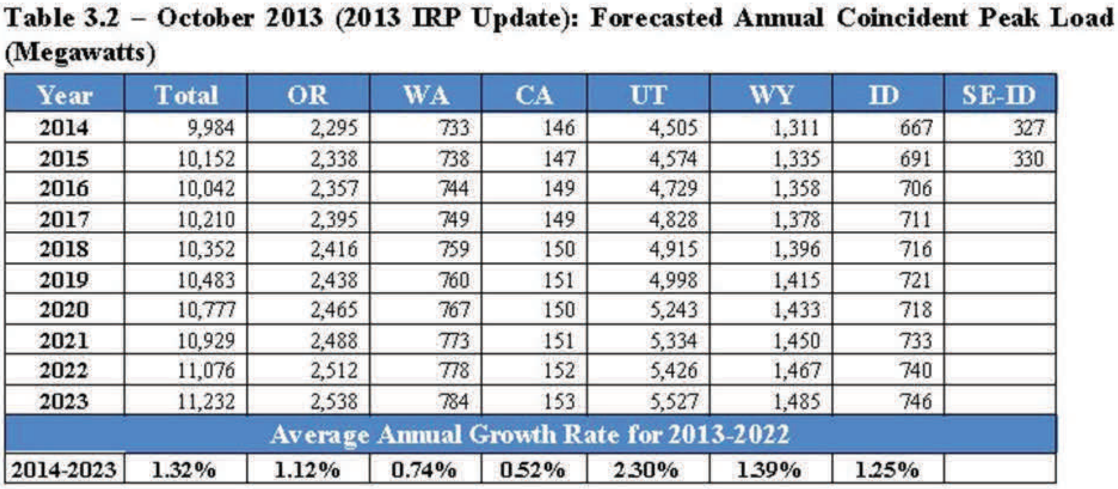


Table 3.2 – October 2013 (2013 IRP Update): Forecasted Annual Coincident Peak Load (Megawatts)

Year	Total	OR	WA	CA	UT	WY	ID	SE-ID
2014	9,984	2,295	733	146	4,505	1,311	667	327
2015	10,152	2,338	738	147	4,574	1,335	691	330
2016	10,042	2,357	744	149	4,729	1,358	706	
2017	10,210	2,395	749	149	4,828	1,378	711	
2018	10,352	2,416	759	150	4,915	1,396	716	
2019	10,483	2,438	760	151	4,998	1,415	721	
2020	10,777	2,465	767	150	5,243	1,433	718	
2021	10,929	2,488	773	151	5,334	1,450	733	
2022	11,076	2,512	778	152	5,426	1,467	740	
2023	11,232	2,538	784	153	5,527	1,485	746	
Average Annual Growth Rate for 2013-2022								
2014-2023	1.32%	1.12%	0.74%	0.52%	2.30%	1.39%	1.25%	

Table 3.1 and 3.2. The 2013 IRP Update, published in March 2014, forecasts the Annual Load Growth (in Megawatt Hours) from 2014 through 2023.

About the Proposed Project:

Gateway South Transmission Project

Gateway South Transmission Project —Growth in Service Area and Increased Demand (continued)

Although the latest two IRP filings indicate a reduction in load and resource projections, (Megawatt increase/year) between the two filings, the need to meet the projected load growth has not diminished, but rather has been shifted out in time. Regardless of changes to the future generating resource mix of PacifiCorp and other regulated utilities, such a resource change will not reduce the need to meet its obligations to provide safe, reliable electricity to its customers at a reasonable cost.

The purpose of the Gateway South Transmission Project is to alleviate constraints within PacifiCorp's existing transmission system, provide integration of planned and existing transmission segments, and improve system reliability and operational flexibility of the bulk electric system. The addition of this line would also provide opportunity to maintain the system with fewer operational constraints.

Gateway South Transmission Project —A Regulated Utility Resource

PacifiCorp's need for the Gateway South Transmission Project is additionally tied to its obligations as a regulated utility. The need to increase transmission capacity and provide safe, reliable electricity to customers at a reasonable cost is our commitment, and also the goal of federal, regional, and local regulatory entities.

PacifiCorp is a vertically integrated electric utility under the jurisdiction of the FERC and six-state regulatory commissions. Pacific Power, a business unit of PacifiCorp, offers service to more than 730,000 retail customers and is subject to regulatory oversight of the Oregon Public Utility Commission, Washington Utilities and Transportation Commission and California Public Utilities Commission. Rocky Mountain Power, also a business unit of PacifiCorp serving over one million customers, operates under the oversight and regulatory controls of the Public Service Commission of Utah, Wyoming Public Service Commission, and the Idaho Public Utilities Commission.

As provided in PacifiCorp's Open Access Transmissions Tariff, under Sections 15.4, 28.2, and 28.3, PacifiCorp is obligated to expand its transmission system to provide requested point-to-point and network transmission service, and to construct and place in-service sufficient capacity to deliver resources reliably to both network and native load customers. PacifiCorp is also required to plan for expansion of the system to ensure that its transmission system meets industry, regulatory and reliability standards.

PacifiCorp is subject to both mandated and voluntary standards which are directed at increasing the supply of renewable (or "green") energy sources as part of its overall least-cost, risk-adjusted, energy resource portfolio. The Energy Gateway Transmission Expansion Program and the Gateway South Transmission Project are both needed to ensure these long-term requirements are met. PacifiCorp, under North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards, needs to plan, construct, and operate its system in a manner that accounts for the overall reliability of the Western Interconnection's electric supply system.

Transmission Service —Third-Parties, Partners and Investments

In addition to providing service to its native load customers, PacifiCorp also is required to provide transmission service to its third–party network customers, which in turn directly serve customers in these same states. PacifiCorp has a legal responsibility to provide reliable transmission service to third parties to the degree transmission capacity is available. The Gateway South Transmission Project was created to meet PacifiCorp's unique transmission capacity needs.

PacifiCorp requires additional transmission capacity to adequately serve its customers' load and growth needs for the next three decades. Recognizing the potential regional benefits of doubling the Gateway South Transmission Project's capacity — including maximizing the use of energy corridors, substantially minimizing environmental impacts and improving economies of scale — PacifiCorp included this potential for doubling the Gateway South Transmission Project's capacity in its original Energy Gateway Transmission Expansion Program to encourage third-party commitments and equity partnerships to support the investment. In the years since the initial announcement of the Energy Gateway Transmission Expansion Program, PacifiCorp has pursued such partnerships. However, due to significant costs that are part of transmission investments, and PacifiCorp's obligation to shelter its end customers from the costs and risks associated with upsizing the Energy Gateway Transmission Expansion Program specifically for third-party benefit, the commitments have not materialized.

Gateway South Transmission Project

Transmission Service —Third-Parties, Partners and Investments (continued)

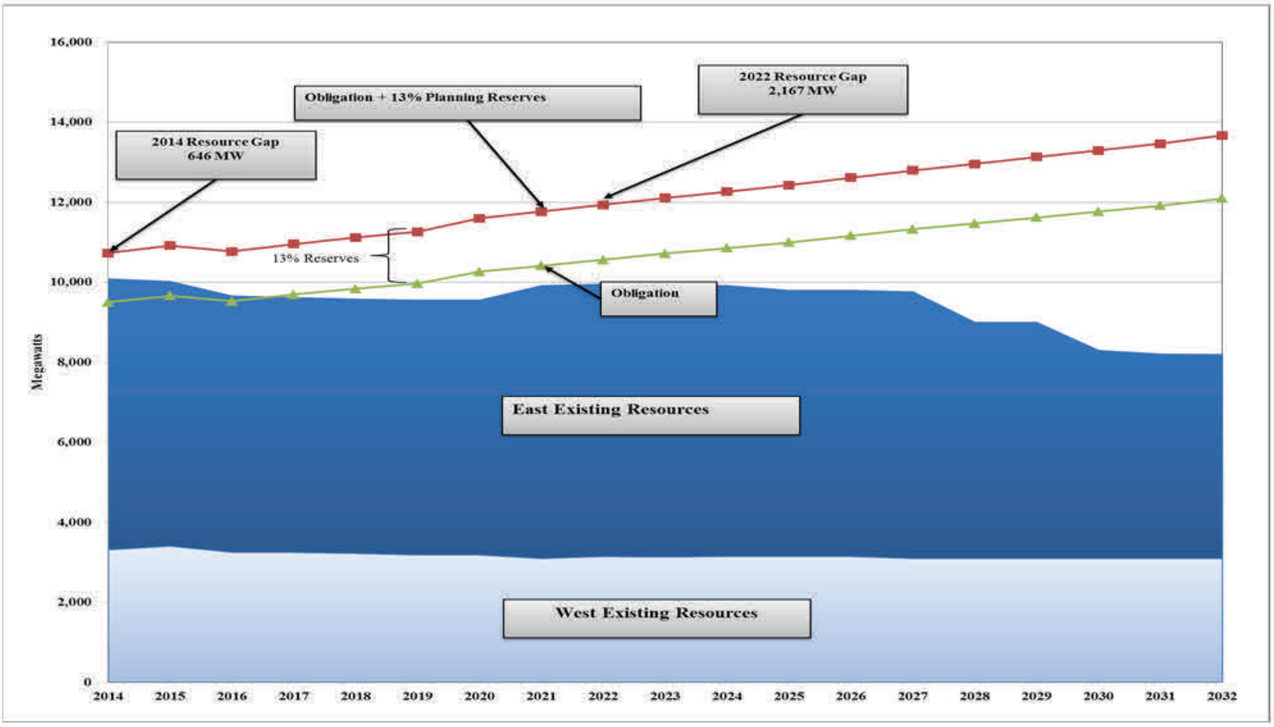
PacifiCorp is committed to building Gateway South Transmission Project to meet the needs of the customers and is moving ahead with the appropriate investments in order to do so. The timing of these investments to construct segments of the Program is dynamic and will be determined based on customer needs and third-party requests and commitments. This decision making process will be publically vetted in PacifiCorp's future Integrated Resource Plans (IRP). The latest IRP is the 2013 Update, and reflects a planned in-service date between the years 2020 and 2022 (See Table 1).

Existing Transmission Capacity, Constraints, and Regional Planning

The capacity ratings of transmission paths are determined based on technical studies that demonstrate compliance with established reliability criteria. PacifiCorp's high–voltage transmission system is composed of multiple 230kV, 345kV, and 500kV segments. Based on current projections (see figure below), loads and the dynamic blend of energy resources are expected to become more complex over the next 20 years, which will challenge the existing capabilities of the transmission network. PacifiCorp along with other regional utilities has determined that the Western Interconnection requires additional transmission facilities to meet increased demand for electrical transmission, including the accommodation of multiple renewable–generation projects.

Transmission reliability and the ability to address capacity or congestion issues in a timely manner represent important planning considerations for ensuring that peak load and energy obligations are met on a reliable basis. The time period required to add significant transmission infrastructure is often longer than adding generation resources or securing third–party resources. Transmission additions must be integrated into regional plans and then permits must be obtained to site and construct the physical assets. Inadequate transmission capacity limits the ability to access what would otherwise be cost effective generating resources.

2013 IRP Update – System Capacity Position



About the Proposed Project:

Gateway South Transmission Project

Existing Transmission Capacity, Constraints, and Regional Planning (continued)

Over the years, regional planning in the Western Interconnection evolved into a three–tiered approach where an interconnection–wide entity, in this case WECC members were required to conduct interregional planning at a high level. Four regional planning groups (Northern Tier Transmission Group–NTTG, Columbia Grid, California Independent System Operator, Westconnect) focus with greater depth on specific areas, and transmission providers perform local planning studies within their region. This coordinated planning helps to ensure that customers in the region are served reliably and at the least cost. PacifiCorp is one of the founding members of NTTG. Formed in 2007, NTTG has the goal of improving the operation and expansion of high–voltage transmission systems that deliver power to consumers in seven western states. The NTTG footprint includes approximately 4.3 million customers and more than 29,000 miles of transmission lines within Oregon, Washington, California, Idaho, Montana, Wyoming, and Utah.

Multiple Company, regional and inter–regional research studies have concluded that there is a critical need to “alleviate transmission congestion and move transmission–constrained energy resources to regional load centers.” These include the Rocky Mountain Area Transmission Study (September 2004), the Western Governors’ Association Transmission Task Force Report (May 2006), the NTTG Fast Track Project Process (2007), the Transmission Expansion Planning Policy Committee (TEPPC) 2009 Annual Report, the 2009 TEPPC Western Interconnection Transmission Path Utilization Study, and other subsequent PacifiCorp planning studies. In addition, the WECC Seams Steering Group–Western Interconnection (SSG-WI) of 2005 analyzed this region, and its results were included in the 2006 U.S. Department of Energy (DOE) National Electric Transmission Congestion Study (DOE 2006). The 2006 DOE study identifies the region from Wyoming to the west as a conditional constrained area, meaning that any generation developed in Wyoming will require additional transmission.

These studies helped develop the design of PacifiCorp’s recommended bulk electric transmission additions, which took on a consistent footprint establishing a triangle of reliability over Idaho, Utah, and Wyoming, with paths extending into Oregon and Washington. The footprint defined by these studies is now known as Energy Gateway. Studies also were performed in 2007 through the NTTG Fast Track Project Process and as part of the approved NTTG 2011 and 2013 Biennial Transmission Plan, which indicated a strong need for a series of independent transmission segments, each of which addresses an independent purpose, though all are part of the larger grid. The Gateway South Transmission Project is an important component of the needed grid expansion identified by that planning effort.

Multiple Company, regional and inter–regional research studies have concluded that there is a critical need to “alleviate transmission congestion and move transmission–constrained energy resources to regional load centers.”

All of these studies show that the existing generation is using all of the transmission capacity from Wyoming and that the addition of generation resources will require more transmission capacity. These studies also show that the cost of generation and transmission in Wyoming is typically much less than energy from other locations.

On a broader scale, the Department of Energy (DOE) also sponsored a study to assess the economic impact of *not* building transmission in the Pacific Northwest. The report was published in July 2008 and used a preliminary engineering review and analysis of planned transmission projects to preliminarily rank the projects based on estimates of their potential economic value, likelihood of execution, resource area(s) being accessed, size, and value to the transmission system as a whole. Although the Gateway South Transmission Project's primary purpose is to serve customers in Utah and the Southwest, it ranked 5th (of 15 major projects) in importance for the Pacific Northwest.

This conclusion provides a strong indicator that the Gateway South Transmission Project is important on both a local and regional scale.

Need to Ensure Reliability

Transmission systems in the United States must be planned, operated, and maintained according to NERC reliability standards. All system planners, users, owners, and operators of the bulk–power system and regional entities must comply with these standards or face significant penalties for noncompliance.

Regionally, PacifiCorp also is governed by WECC standards and criteria, which may be more stringent than those required by NERC. Compliance with these standards requires transmission systems to be planned and constructed with sufficient levels of redundancy to maintain reliable operation in the event of a loss or outage of system elements (i.e., transmission line segment or substation). NERC and WECC performance requirements also require detailed risk assessments of system impacts that would result from a multitude of outage scenarios. Compliance with these standards and regional criteria is not optional for PacifiCorp as a Transmission Owner and Transmission Planner under NERC registration.

The NERC and WECC standards and criteria are performance–based. Therefore, they do not dictate the site–specific locations of proposed transmission lines. The physical arrangement of new and existing lines and corridors is left to the transmission provider because it is most knowledgeable about the best method to meet its system performance requirements and manage reliability risks and costs. Should a transmission provider fail to meet NERC standards and WECC criteria resulting in widespread uncontrolled loss of generation or customer demand, it would be required per WECC System Performance TPL-001-WECC-CRT-2.1, WR5 Regional Criterion, to take action “so that future occurrences of the event will not result in cascading, or it must demonstrate that the Mean Time Between Failure (MTBF) is greater than 300 years (frequency less than 0.0033 outages/year) and approved by PCC.” Severe measures would be required to meet this elevated level of required system performance .

PacifiCorp must have a forward–looking transmission plan of action to reliably serve current and anticipated future customer demands under all expected operating conditions.

NERC Transmission Planning Standard TPL-002 states that “system simulations and associated assessments are needed periodically to ensure that reliable systems are developed that meet specified performance requirements with sufficient lead time, and continue to be modified or upgraded as necessary to meet present and future system needs.”

This means PacifiCorp must have a forward–looking transmission plan of action to reliably serve current and anticipated future customer demands under all expected operating conditions, including normal system operations (all system elements in service) and during system contingencies (where elements of the transmission system are out of service), both planned or unplanned.

Collectively these standards are designed to protect the Western Interconnection by dictating minimum performance levels of transmission system reliability for projects like the Gateway South Transmission Project. In the event that a new transmission line fails to perform in accordance with these reliability requirements, PacifiCorp may be required by WECC and NERC to limit the capacity or operation of the lines to levels that would not cause major disturbances or disruptions to the Western Interconnection. Therefore, the Gateway South Transmission Project has been designed such that a common–mode outage would not result in a reduction of its rated capacity (de–rating). This approach protects PacifiCorp's ability to maintain its obligations to its native load and network customers and minimizes the risk of a de–rating. If the Gateway South Transmission Project were subject to a de–rating, then PacifiCorp would be required to mitigate for the lost capacity. Given the scale of the Gateway South Transmission Project, this scenario would require the design and construction of an additional 500kV transmission facility, which would add significant cost to customers and increased environmental impacts.

Populus to Terminal Transmission Project and Impacts to the Energy Gateway Transmission Program

Studies conducted by PacifiCorp in 1982 established the 1000MW bi-direction path rating for the Path C transmission path. This "Existing" path rating was established based on single-contingency (N-1) outage of the Ben Lomond – Borah 345kV line overloading other transmission facilities.

A disturbance on the Western Interconnection occurred on July 2, 1996 that ultimately resulted in electric service interruptions to over two million customers, and took two nuclear reactors off-line.

The simultaneous combination of operating conditions on July 2, characterized by record peak summer demands in Idaho and Utah, maximum water flow conditions in the Pacific Northwest, high north-to south electricity transfers on the California -Oregon AC and DC interties, transfers from the Northwest to Idaho and Utah, high volumes of electricity transfers from Canada to the Northwest, and high amounts of thermal generation in Wyoming and Utah were not anticipated or studied. The speed of the collapse seen July 2 was not previously observed in this region and was not anticipated in studies.

Insufficient voltage support in the Northwest and Idaho for the operating conditions of July 2 was a primary factor that contributed to the widespread impact of this disturbance. The initiating event, the near simultaneous outage of two 345kV Jim Bridger-West lines, should not have resulted in the system separations and loss of demand experienced on July 2, 1996.

This occurrence resulted in a derating of transmission paths in the Western Interconnection including Path C and for PacifiCorp a demand that new facilities be constructed in order to serve PacifiCorp's customers located in Utah's Wasatch Front. In order to restore the Path C rating, a new transmission line, Populus to Terminal, was required to be constructed.

Additionally, to fully integrate the project with the southern Idaho transmission system (including the Bridger West transmission path) the project called for looping the Ben Lomond – Borah 345kV, Bridger – Borah 345kV and Bridger – Kinport 345kV lines into the Populus 345kV substation.

In support of the proposed Populus – Terminal 345kV project facility additions, transmission path rating studies were performed in 2008 by a WECC project review group that identified the positive improvement that the project made to the Path C rating.

Following completion of the studies, and acceptance of technical study finding by all utilities in the Western Interconnection, WECC granted the project Phase 3 status (permitting, construction, and progress monitoring phase) on November 20, 2008 with an Accepted Rating of 1600MW north to south, and 1250MW south to north.

On November 19, 2010, the Path C transmission path rating was increased when all Populus – Terminal 345kV project facilities were placed in-service. WECC was informed of this project status on November 24, 2010.

One of the key objectives of adding the Populus – Terminal 345kV project was an improvement in system reliability, which was expected when the southern Idaho transmission system is tied more closely with the northern Utah transmission system. Since the Populus – Terminal project was placed into service in 2010, a number of system events have occurred that have demonstrated the importance of this project on overall system reliability of the PacifiCorp – East (PACE) Balancing Authority. These events have demonstrated that the project has resulted in improved voltage performance during steady-state and system outage conditions.

One event that emphasized the importance of this project on system reliability of the PACE BA, as well as the Western Interconnection, occurred on July 19, 2011. On this day, Path C flows briefly went above 1600 southbound because the entire region was short on energy and the WECC Reliability Coordinator (RC) was coordinating phase shifter operations to maximize the transmission paths without overloading specific paths. As a result of these actions, Path C flows "spiked" when more energy was being pushed from north to south through PacifiCorp's system and adjacent systems.

Without the Populus – Terminal 345kV project, such an event could have significantly impacted the transmission system from southeast Idaho to central Utah – potentially resulting in a major system event in Utah and potentially the Western Interconnection.

WECC Planning Studies to Establish Line Ratings

The WECC path rating studies are required to account for outages or, in other words, events and circumstances that are deemed credible based on the utility's system operating experience and history. Within the Gateway South Transmission Project area, there are other existing and planned EHV lines that PacifiCorp must consider when siting the Gateway South Transmission Project. If the proposed Gateway South Transmission Project and the other EHV lines are all co–located in close proximity then PacifiCorp must be able to demonstrate it has an acceptable back–up plan in place should they be simultaneously out of service for any reason.

For PacifiCorp to reliably serve future loads within its service area, a new transmission line needs to be designed such that it meets NERC and WECC planning and reliability criteria. However, meeting these planning criteria does not relieve PacifiCorp of other performance–based standards enforced by WECC. In particular if a severe system disturbance occurs due to line outages, PacifiCorp's experience demonstrates that WECC may reduce the line ratings and useable capacity in order to restore system reliability. Under such a scenario, PacifiCorp would expect that construction of a new line would be needed to make up for the lost capacity.

Use of Federally Designated Corridors

As part of its original feasibility analysis, PacifiCorp considered routes in federally designated corridors located within the Gateway South Transmission Project area, but suggested the removal of some routes from further consideration based upon many factors, including its fundamental need to comply with NERC and WECC requirements. The West–Wide Energy Corridors (WWEC) Programmatic Environmental Impact Statement (PEIS) published by the Department of Energy, Bureau of Land Management, and Forest Service confirms that compliance with NERC and WECC standards is essential to reliability.

The WWEC PEIS concludes that "…by far the most cost effective preemptive strategy against multiple simultaneous line loss involves ensuring adequate distance separation between lines at the planning stage. Experience among WECC system operators has also shown that the nature of the land between lines…should dictate safe separation distances on a case–by–case basis…[I]n forested areas or in areas where vegetation provides substantial amounts of fuel for fires, greater line spacing (up to 5 miles) may be necessary to prevent adjacent lines from becoming simultaneously involved in faults caused by ionized smoke."

PacifiCorp's planning for the Gateway South Transmission Project, therefore, incorporates the findings of the WWEC PEIS as well as its own experience.

El Dorado Valley Designated Utility Corridor

Company and Industry Experience

As described above, PacifiCorp is required to use its experience when planning for new facilities. PacifiCorp has over 100 years of experience with instances of multiple transmission lines located in the same general proximity experiencing simultaneous outages due to a variety of causes, including but not limited to fire and smoke, high winds, dust storms, ice storms, blizzards, lightning, landslides, earthquakes, vandalism, tower or conductor failure, equipment failure, airplane collisions, and other experience.

The following examples demonstrate the need for PacifiCorp and the affected land–management agencies (e.g., Bureau of Land Management, Forest Service) to consider separation distances during the planning, design, and siting of the Gateway South Transmission Project as a means to reduce risk to system reliability in the planning and construction of new transmission lines:

1981. Fire forced two 345kV lines north of Camp Williams out of service and a third 345kV line cascaded, resulting in a Utah state–wide blackout.

1982-83. Landslides destroyed transmission towers on the two Emery to Sigurd 345kV lines.

1983. Severe winds destroyed sections of seven lines between Salt Lake City and Ogden (345kV, 230kV and 138kV)

1990. A U.S. Air Force jet clipped an overhead shield wire, which wrapped around the double–circuit 345kV and 230kV lines between Terminal and Ben Lomond substations, causing outages.

2000. Fires in the corridor of Emery to Camp Williams and Huntington to Spanish Fork lines forced 345kV lines out of service.

2002-03. Multiple fires in the corridor between Mona and Camp Williams forced lines out of service.

2007. Fire caused both the Mona to Huntington and Mona to Bonanza 345kV lines in Central Utah to be de–energized for fire crew safety.

2007. Fire forced three 345kV lines connecting Jim Bridger in Wyoming and southeast Idaho out of service.

In addition to PacifiCorp's experience, other utilities in the WECC interconnection have experienced significant system outages:

1990. Fires caused six simultaneous outages (along with 17 single–line outages) of two Round Mountain to Table Mountain 500kV lines in northern California. Fires burned randomly back and forth across the corridor for more than 12 miles. Customer load interruptions ranged from 90MW to 1,000MW at times.

1993. High winds caused the loss of two adjacent 500kV line towers on the Pacific Intertie, leaving an estimated 5.2 million customers in several states without power. This simultaneous loss of two major EHV lines resulted in a system reliability and capacity review that led to the requirement in 1993 to build a third 500kV transmission line across the Pacific Intertie to restore capacity and improve reliability.

PacifiCorp has the experience and knowledge to be proactive in the planning and construction of the proposed transmission line projects in order to reduce risk to future reliability.

Acronyms and Definitions

Commonly Used Program/Project Acronyms and Definitions

Several acronyms and technical concepts are used in the document and the reader will better understand this report by becoming familiar with the following terms:

Adjacent Transmission Circuits: (as defined by Western Electricity Coordinating Council [WECC] TPL-001-WECC-CRT-2 System Performance Criterion) Two transmission circuits with separation between their center lines less than 250 feet at the point of separation with no Bulk Electric System circuit between them. Transmission circuits that cross, but are otherwise separated by 250 feet or more between their centerlines, are not Adjacent Transmission Circuits.

Bulk Electric System: The electrical generation resources, transmission lines, interconnections with neighboring systems and associated equipment generally operated at voltages of 100 kilovolts (kV) or higher. Radial transmission facilities serving only loads with one transmission line source generally are not in this definition.

Contingency Analysis: An assessment to determine the risk and system impact of certain facility outage scenarios on the electrical network.

Contingency Reserves: The generating capacity immediately available to a system operator to meet customer demand in the event of generator failure or transmission system outage. (i.e., contingencies).

Electrical Transfer: Power in an alternating current (AC) electric network does not travel along any one set path. Instead, power flows from a “generation source” to a “load sink” along all the paths that can connect them. This means that changes in generation and transmission at any point in the system will change loads on generators and transmission lines at every other point—often in ways not easily controlled.

Energy Gateway Transmission Expansion Program: PacifiCorp’s large–scale transmission expansion program that consists of three principal legs: Gateway Central, Gateway West, and the subject project, Gateway South Transmission Project. Two Energy Gateway segments have been constructed including Populus to Terminal 345kV and Mona to Oquirrh 500kV/345kV. Sigurd to Red Butte 345kV No. 2 is also under construction with an in-service date of June 2015.

Extra–high Voltage (EHV): Electric transmission facility energized at 300,000 volts (300kV) or greater.

Fault: A condition when one or more electrical conductors contact the ground and/or each other typically resulting in protective equipment tripping out of service to stop the fault current that is several times larger in magnitude than the current that normally flows through a circuit.

Generation Tripping: An intentionally engineered loss or shut–down of generation facilities in response to system disturbances.

Load Shedding: An electrical power outage wherein a customer’s electrical service is intentionally interrupted. Causes can be due to insufficient electrical generation capacity or transmission system outages. Load shedding, under certain contingency conditions, may be used by an electric utility company in order to avoid a cascading event that may result in a widespread blackout of the power system.

Mean Time Between Failures (MTBF): The elapsed time between failures of a system element or event during operation.

North American Electric Reliability Corporation (NERC): NERC is a self–regulatory, non–government organization that has statutory responsibility to regulate bulk power system users, owners, and operators through the adoption and enforcement of standards for fair, ethical and efficient practices. As of June 18, 2007, the Federal Energy Regulatory Commission (FERC) granted NERC the legal authority to enforce reliability standards with all users, owners, and operators of the bulk power system in the United States, and made compliance with those standards mandatory and enforceable.

Open Access Transmission Tariff (OATT): Requirement that all public utilities that own, control or operate facilities used for transmitting electric energy in interstate commerce provide non-discriminatory transmission tariffs.

Redundancy: The duplication of critical system components or transfer capacity of a system with the intention of increasing or maintaining reliability, usually a backup or fail–safe.

Transmission Capacity: The amount of power a transmission line can reliably deliver.

Transmission Path: Multiple transmission lines generally located in similar alignments and operating electrically in parallel are referred to as electrical transmission “paths.”

Transmission Expansion Planning Policy Committee: TEPPC is a WECC Board committee that conducts and facilitates economic transmission planning for the Western Interconnection. TEPPC activities include fulfilling transmission owner/operator and Subregional Planning Group planning requirements under FERC Order 890. TEPPC has a balanced membership comprised of individuals from WECC–member organizations and stakeholders.

Western Electricity Coordinating Council: WECC is the regional entity responsible for coordinating and promoting bulk electric system reliability in the Western Interconnection.

Western Interconnection: The interconnected electrical systems that encompass the region of the Western Electricity Coordinating Council of the North American Electric Reliability Council. The region extends from Canada to Mexico. It includes the provinces of Alberta and British Columbia, the northern portion of Baja California (Mexico), and all or portions of the 14 western states in between.

Appendix B
Applicant's Description of the Project

PROJECT DESCRIPTION

PacifiCorp (doing business as Rocky Mountain Power), the Applicant for right-of-way across federal lands for the purpose of constructing, operating, and maintaining the proposed Gateway South transmission line as associated facilities, submitted this description of the project to enable the Bureau of Land Management (BLM), to determine and disclose the potential impacts of the project on the environment. This project description includes descriptions of components (e.g., transmission line structures, communication system, series compensation stations, terminal substations) and activities associated with construction, operation, and maintenance associated with a typical 500-kilovolt transmission line. The project description applies to all alternative routes addressed in the Energy Gateway South Transmission Project Environmental Impact Statement (EIS). In a few instances, calculations are provided for an alternative route, but are intended to be representative of all alternative routes. The project description included as Appendix B in the Draft EIS (January 2014) was refined from the original application (December 2008) and submitted to the BLM in August 2013, and was updated most recently in early 2015 for preparing the Final EIS.

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LIST OF ACRONYMS

AC	Alternating current
ANSI	American National Standards Institute
ATV	All-terrain vehicle
CPT	Cone penetration test
EIS	Environmental impact statement
FAA	Federal Aviation Administration
IEEE	Institute of Electrical and Electronics Engineers
IRP	Integrated Resource Plan
kV	Kilovolt
MW	Megawatt
NEPA	National Environmental Policy Act of 1969
NERC	North American Electricity Reliability Council
NESC	National Electrical Safety Code
OATT	Open access transmission tariff
OHGW	Overhead ground wire
OPGW	Optical ground wire
POD	Plan of Development
ReMi	Refraction microtremor
WECC	Western Electricity Coordinating Council

1 INTRODUCTION

This appendix contains information provided by PacifiCorp (doing business as Rocky Mountain Power, the Company), applicant for right-of-way across federal land for construction, operation, and maintenance of the Energy Gateway South Transmission Project (Gateway South or Project). This appendix provides detailed information regarding the scope of work and components of the transmission system evaluated in the environmental impact statement (EIS) for the Project, including the transmission structures, communications system, and substations and series compensation stations. The component descriptions (Section 1.0) apply to the transmission segments and substation descriptions. It provides details regarding the system components (Section 2.0) and construction of the system (Section 3.0), provides information regarding the operations and maintenance of the system (Section 4.0), and decommissioning (Section 5.0).

The Project is part of the Company’s transmission expansion program, called Energy Gateway, which is intended to add new transmission lines connecting new and existing generation resources to customers throughout the Company’s service territory. Energy Gateway is composed of several large-scale projects that will address customers’ increasing electric energy use and improve system reliability.

The Project is designed to provide 1,500 megawatts (MW) of new capacity needed to meet the current and forecasted needs of the Company's customers. These forecasts are based on the Company’s 2013 Integrated Resource Plan (IRP) as required to fulfill the regulatory requirements and guidelines established by the public utility commissions of the states served by the Company. The IRP addresses the obligations of each company pursuant to its open access transmission tariff (OATT) to plan for and expand its transmission system in a nondiscriminatory manner based on the needs of its native load and network customers.

Gateway South is independent of, and would be built regardless of, any particular new generation or transmission project(s) that are also planned. The transmission grid, of which it would become a part, can be thought of in terms of hubs, spokes, and a backbone connecting the hubs. Each substation is a hub, and receives or sends electricity along the spokes. For this system to work, a backbone of high-capacity transmission lines is needed to connect the hubs and transport the electricity to where it is needed.

The purpose of the transmission line is to satisfy several distinct, yet inter-related needs, explained above. The purposes of the Project relative to meeting these needs are summarized below:

- Provide long-term transmission capacity to move resources to growing load centers
- Connect Gateway West and Gateway Central, providing operational flexibility for the bulk electric network, reliability, and supports path ratings for each segment
- Improve capacity and reliability of other interconnected transmission lines associated with Energy Gateway
- Reduce transmission limitations on the existing system
- Provide incremental transmission capacity planned at approximately 1,500 MW

As proposed, the Project would be comprised of an extra-high-voltage alternating current (AC) transmission line that would run between planned, proposed, and existing substations. A proposed single-circuit 500-kilovolt (kV) transmission line approximately 400 to 540 miles in length (depending on the alternative route chosen) would begin at the planned Aeolus Substation (planned as part of Gateway West) near Medicine Bow, Wyoming; connect to two separate, proposed series compensation substations;

and terminate at the existing Clover Substation (built as part of Gateway Central) near Mona, Utah. The two proposed series compensation substations would be located at approximately the one-third and two-thirds points of the transmission line between the Aeolus and Clover substations. Modifications at the existing Mona Substation are required to re-terminate existing lines to accommodate the nearby 500kV termination at Clover Substation.

1.1 Transmission Segment Descriptions

A schematic diagram of the Project segments described below is provided as Figure 1 – Project Layout Diagram.

1.1.1 Segment 1 Aeolus – Series Compensation Substation No. 1

Segment 1 is composed of one single-circuit 500kV transmission line[1] proposed between the planned Aeolus Substation near Medicine Bow, Wyoming, and the proposed Series Compensation Substation No. 1. The location of Series Compensation Substation No.1 would be dependent on the transmission-line route selected.

1.1.2 Segment 2 Series Compensation Substation No. 1 – Series Compensation Substation No. 2

Segment 2 is composed of one single-circuit 500kV transmission line proposed between the proposed Series Compensation Substation No. 1 and the proposed Series Compensation Substation No. 2. The location of Series Compensation Substation No. 2 would be dependent on transmission-line route selected.

1.1.3 Segment 3 Series Compensation Substation No. 2 – Clover Substation

Segment 3 is composed of one single-circuit 500kV transmission line proposed between the proposed Series Compensation Substation No. 2 and the Clover Substation. The location of Clover Substation is near Mona, Utah.

1.1.4 Segment 4a Clover Substation – Mona Substation No. 1

Segment 4a consists of rebuilding the single-circuit portion of the Clover – Mona 345kV No. 1 transmission line between the Clover Substation and the Mona Substation. The line is approximately 3 miles in length and would be rebuilt on existing right-of-way.

1.1.5 Segment 4b Clover Substation – Mona Substation No. 2

Segment 4b consists of rebuilding the single-circuit portion of the Clover – Mona 345kV No. 2 transmission line between the Clover Substation and the Mona Substation. The line is approximately 3 miles in length and would be rebuilt on existing right-of-way.

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[1] A single-circuit transmission line (whether 345kV or 500kV) is composed of three electrical phases and two lightning protection shield wires. One of the lighting-protection shield wires is a steel overhead ground wire (OHGW), and the other is typically an optical ground wire (OPGW). The OPGW contains glass fibers used for communication along the fiber path for data transfer between the Company’s facilities. The data transferred is required for system control and monitoring.

1.1.6 Segment 4c Mona Substation – Huntington Substation

Segment 4c consists of rerouting the existing Mona – Huntington 345kV transmission line into the Clover Substation and then out of the substation headed north to the Mona Substation. This reroute would involve construction of two new single-circuit 345kV transmission-line segments extending off the existing route, approximately 1 mile in length each.

A new transmission-line corridor would be needed for the north-south portion of the new line between the Mona Substation and Clover Substation, north of the Clover Substation. Also, a new transmission corridor would be needed for a new alignment extending east-west from the existing Mona – Huntington 345kV line into the existing Clover Substation. Existing/abandoned structures would be removed when the new transmission lines are placed in service.

1.1.7 Bears Ears to Bonanza 345kV Relocation

PacifiCorp will relocate a small portion of the existing Bears Ears to Bonanza line outside the Raven Ridge ACEC in a manner as to also accommodate the GWS alignment outside the ACEC. Engineering details regarding the relocation will be completed upon approval of a final route in the Record of Decision and right-of-way grant.

1.2 Substation Descriptions

1.2.1 Aeolus Substation

This planned substation will be built as part of the Gateway West and a single 500kV dead-end structure will be constructed inside that substation for this Project. Major facility/equipment additions to be installed at Aeolus Substation for Gateway South include, but are not limited to, substation steel dead-end structures and bus work. It is anticipated that all work involved with terminating the Gateway South 500kV line would be performed within the substation fence as proposed by Gateway West.

1.2.2 Series Compensation Substation No. 1

Construction of proposed Series Compensation Substation No. 1 would consist of installation of circuit breakers and related switching equipment, bus supports, and other equipment to be installed for the 500kV transmission-line structures. Additional equipment, including 500kV series capacitors, shunt-reactor banks, and emergency generators along with all associated site preparation, fencing, foundations, protection, control, communications equipment, and metering would be installed. Locations for the series compensation stations have not yet been identified, but would be located approximately one-third the distance from the Aeolus Substation to the planned Clover Substation. Based on a route of approximately 400 miles, this places this station approximately 133 miles from Aeolus Substation.

1.2.3 Series Compensation Substation No. 2

Construction of proposed Series Compensation Substation No. 2 would consist of installation of circuit breakers and related switching equipment, bus supports, and other equipment to be installed for the 500kV transmission-line structures. Additional equipment, including 500kV series capacitors, shunt-reactor banks, and emergency generators along with all associated site preparation, fencing, foundations, protection, control, communications equipment, and metering would be installed. Locations for the series compensation stations have not yet been identified, but generally would be located approximately two-thirds the distance from the planned Aeolus Substation to the planned Clover Substation. Based on aroute of approximately 400 miles, this places this station approximately 133 miles from both Clover Substation and Series Compensation Station No. 1.

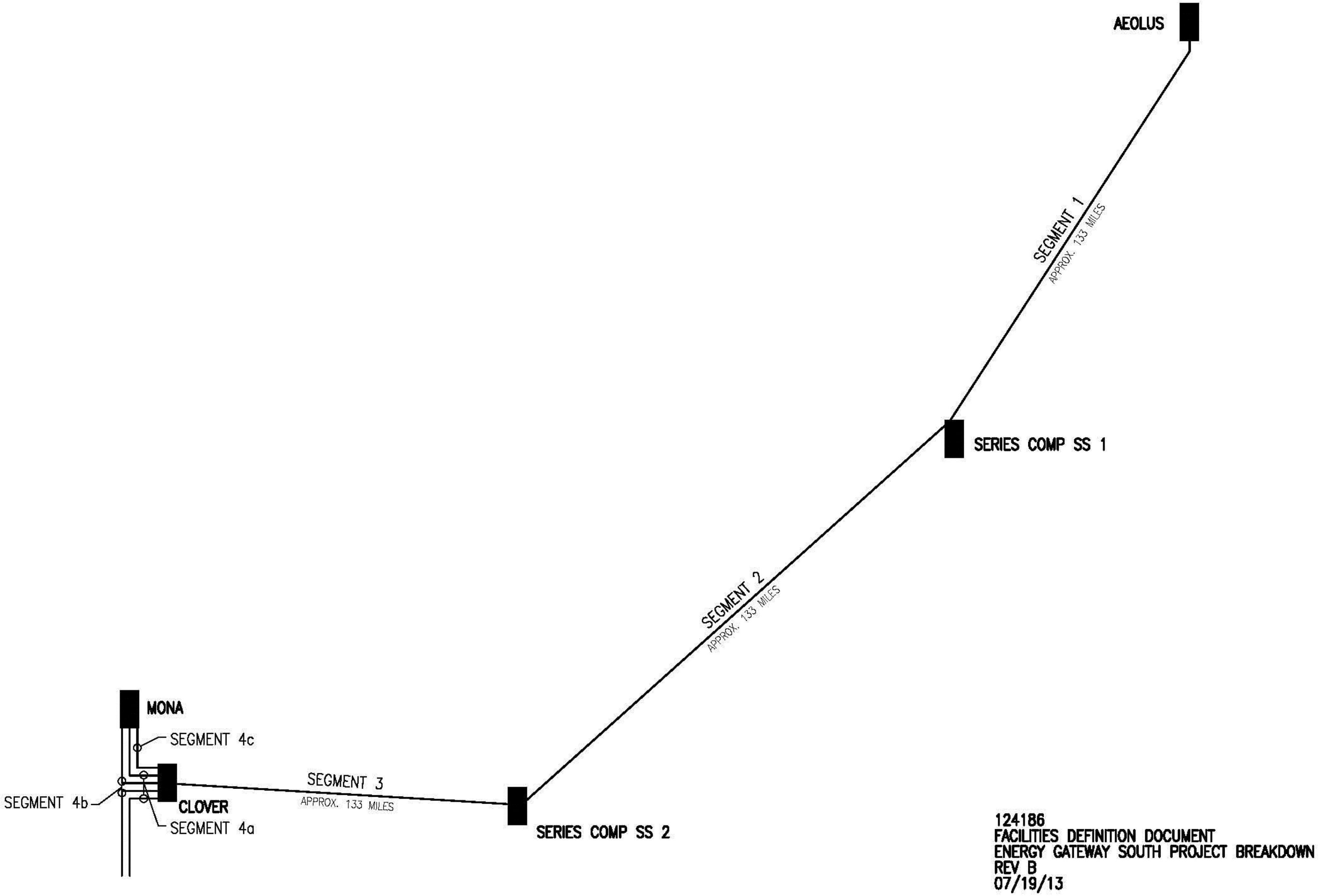
1.2.4 Clover Substation

Clover Substation is an existing facility of Gateway Central and has been permitted and assessed under previous National Environmental Policy Act (NEPA) documentation. Expansion of the existing facility, within the area previously permitted and assessed, is necessary to accommodate the equipment required to terminate the new 500kV and 345kV transmission lines into the substation. Major facility/equipment additions to Clover Substation include, but are not limited to, 500kV and 345kV related equipment; i.e., circuit breaker(s), shunt capacitor(s), series capacitor(s), and shunt reactor(s) along with all associated site preparation, fencing, foundations, steel substation towers, bus work, and protection and control metering.

1.2.5 Mona Substation

Changes to the existing Mona Substation occurring within the existing fence line include installation of new circuit breakers, protective relaying metering, substation structural members, and bus work to upgrade the Mona to Clover No. 1 and No. 2 transmission line bays. For Gateway South, it is anticipated that the current footprint of the Mona Substation will remain the same with no expansion of the substation required.

Figure 1 Project Layout Diagram



2 SYSTEM COMPONENTS

This section describes the various components of the transmission system for the Project, including the structures themselves, conductors used, other hardware needed, communication system, access to right-of-way, and, finally, the substations. Both the proposed and alternative structures are described below.

2.1 Transmission Structures

2.1.1 Types of Transmission Line Support Structures

The proposed transmission line circuits typically would be supported by the following types of 500/345kV structures: 500kV self-supporting single circuit lattice steel, self-supporting single circuit steel H-frame, single circuit “guyed” lattice steel, single circuit steel mono-pole and/or 345kV double circuit steel mono-pole structures. Tangent structures are designed to support the conductors where the transmission-line angle at the structure location is typically 1 degree or less, meaning the transmission line is essentially a straight line. Very similar structures by appearance support the line at line angle (direction changes) up to about 30 degrees. A structure with more complex insulator assembles and heavier/stronger structures would be used when line angles are greater than 30 degrees.

500-KILOVOLT STEEL STRUCTURES

Lattice-steel structures, Figures 2, 3, 5, and 6 would be fabricated with galvanized steel members treated to produce a dulled galvanized finish. The average distance between 500kV structures, or span, would be 1,000 to 1, 800 feet (with an average span length of 1,500 feet) with occasional longer spans in rough terrain. Structure heights would vary depending on terrain and the requirement to maintain minimum conductor clearances from ground. The 500kV single-circuit structures would vary in height from 140 to 200 feet.

In general, single-circuit guyed lattice steel structures would be used in Wyoming, Colorado, and portions of Utah as tangent towers (in locations that have a line angle equal to or less than 1 degree) in flat to rolling terrain. In areas where terrain is rougher and in locations that have a line angle equal to or less than 1 degree, tangent towers would be self-supporting lattice steel structures. Self-supporting lattice steel towers would be used in all areas of the project where angles in the line would be greater than 1 degree.

H-frame steel structures, Figure 4, would be fabricated as tubular self-weathering steel treatment to produce a rust-like finish. The average distance between 500kV structures would be 1,200 to 1,300 feet. Structure heights would vary depending on terrain and the requirement to maintain minimum conductor clearances from ground. The 500kV single-circuit H-frame structures would vary in height from 110 to 165 feet.

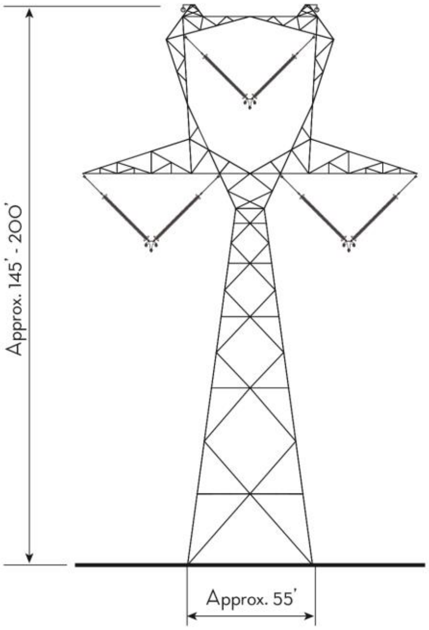


Figure 2 Proposed Tangent Single-circuit 500-kilovolt Lattice Steel Structure (Delta Configuration)

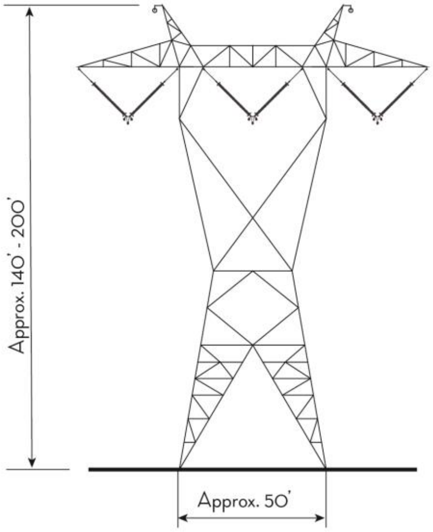


Figure 3 Alternate Proposed Single-circuit 500-kilovolt Lattice Steel Structure (Horizontal Configuration)

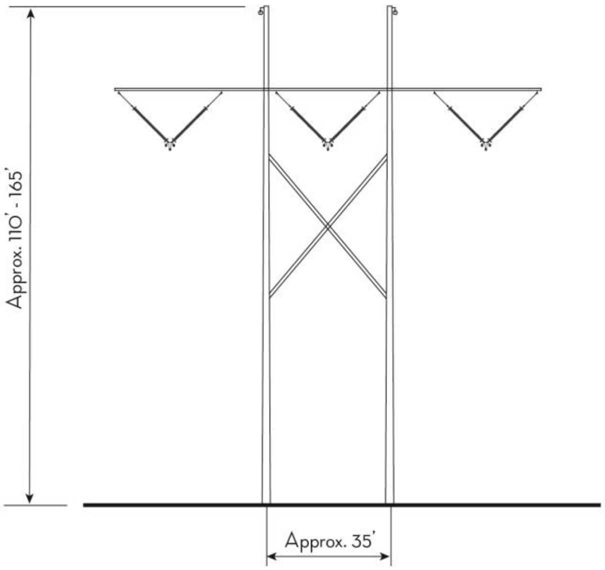


Figure 4 **Proposed Tangent Single-circuit 500-kilovolt H-frame Structure**

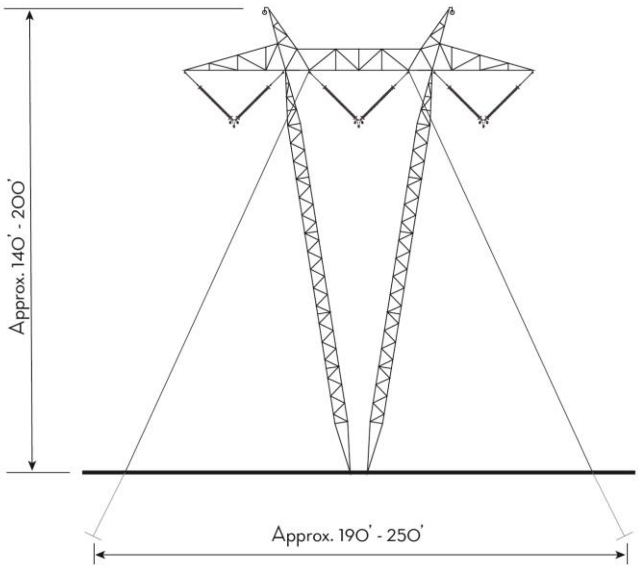


Figure 5 **Proposed Guyed V**

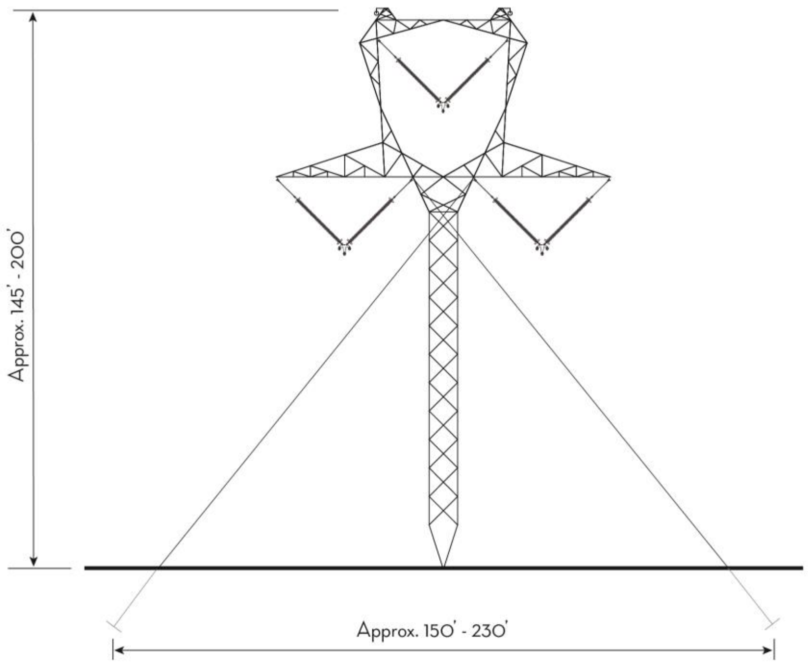


Figure 6 Proposed Guyed Delta

345-KILOVOLT STEEL STRUCTURES

The two existing and one proposed 345kV single-circuit transmission lines between the Clover and Mona substations (Segments 4a, 4b, and 4c) would use steel H-frame, steel mono-pole single circuit, and/or steel mono-pole double circuit 345kV structures (Figures 7, 8 and 9). PacifiCorp will relocate a small portion of the existing Bears Ears to Bonanza 346kV line outside the Raven Ridge ACEC in a manner as to also accommodate the GWS alignment outside the ACEC. Engineering details regarding structure types will be completed upon approval of a final route in the Record of Decision and right-of-way grant.

The 345kV structures would be steel H-frame, steel mono-pole single-circuit or steel mono-pole double-circuit structures depending on final design requirements. The steel H-frame structures would use self-weathering steel or a dulled galvanized steel finish. Weathering steel is manufactured from a group of steel alloys that were developed to eliminate the need for maintenance painting. This type of steel alloy forms a stable dark red-brown rust-like appearance after exposed to the weather for a few years. The average distance between H-frame structures would be approximately 800 to 1,200 feet. Typically, the 345kV single-circuit H-frame structures would have pole lengths ranging between 80 and 140 feet. Embedment depths are typically 10 percent of the pole length plus 5 feet, which in the case of this Project is expected to range between 13 and 19 feet.

The average span between single-circuit monopole structures would be approximately 700 to 800 feet. Structures would be set on a drilled-pier foundation. The structure heights above ground would vary from 85 to 130 feet.

The average distance between double-circuit monopole structures would be approximately 700 to 800 feet. Structures would be set on a drilled-pier foundation. The structure heights above ground would vary from 95 to 150 feet.

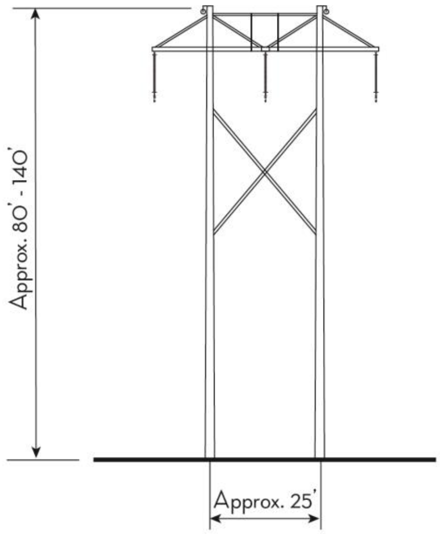


Figure 7 Proposed Tangent Single-circuit 345-kilovolt H-frame Structure

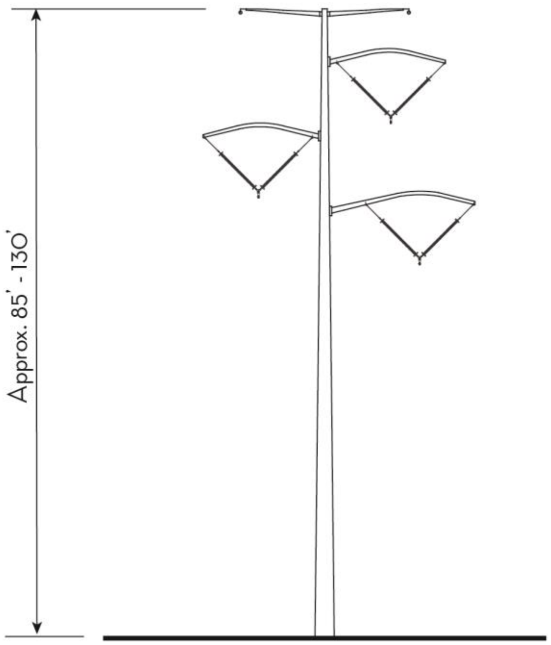


Figure 8 **Proposed Single-circuit 345-kilovolt Mono-pole Tangent Structure (for angles 0°–5°)**

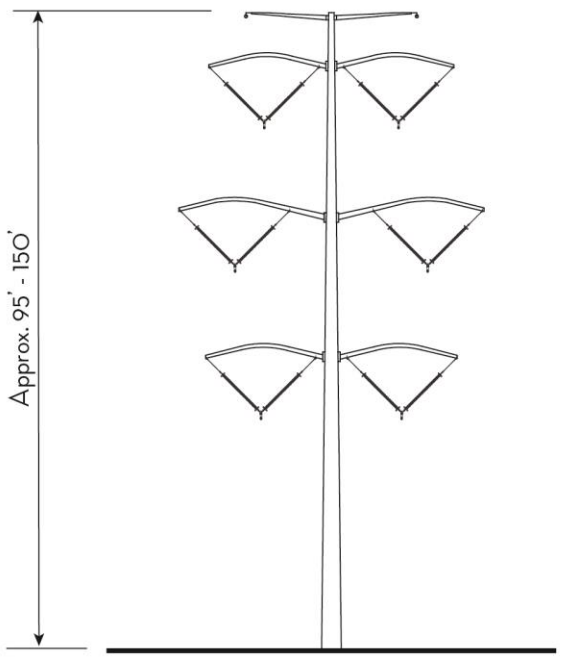


Figure 9 Proposed Double-circuit 345-kilovolt Mono-pole Tangent Structure (for angles 0°–5°)

2.1.2 Structure and Conductor Clearances

Conductor phase-to-phase and phase-to-ground clearance parameters are determined in accordance with the National Electrical Safety Code (NESC), ANSI C2, produced by the American National Standards Institute (ANSI) and are often supplemented by PacifiCorp's own standards that further address safety and performance criteria. The NESC code provides for minimum distances between the conductors and ground, crossing points of other lines and the transmission support structure and other conductors, and minimum working clearances for personnel during energized operation and maintenance activities (Institute of Electrical and Electronics Engineers [IEEE] 2007). Typically, the clearance of conductors above ground is no less than 35 feet for 500kV and no less than 30 feet for 345kV. During detailed design, clearances may be increased to account for localized and special conditions.

2.1.3 Structure Foundations

The 500kV single-circuit lattice-steel self-supported structures each require four foundations with one on each of the four corners of the lattice structures. The 500kV H-frame requires two foundations, one foundation for each tubular steel leg. The foundation diameter and depth for both steel-lattice and H-frame structures would be determined during final design and are dependent on the type of soil or rock present at each site; typical diameters and depths of foundation are shown in Table 1. Typically, the foundations for the self-supported single-circuit tangent lattice and H-frame structures would be composed of steel-reinforced concrete drilled piers.

Guyed V and Delta type structures require a single foundation located where the support legs meet the ground surface. Guyed V and Delta structures each require four guy anchors.

Table 1
Typical 500-kilovolt Structure Type Foundation

Structure Type	Number of Foundations /Anchors	Foundation Diameter (feet)	Foundation Depth (feet)	Area of All Foundations (square feet)
Tangent lattice (Delta Configuration)	4	4.0	21.0	52.0
Tangent lattice (Horizontal Configuration)	4	4.0	21.0	52.0
Small angle lattice	4	4.0	27.0	52.0
Medium angle lattice	4	4.0	30.0	52.0
Medium dead-end lattice	4	5.0	36.0	80.0
Heavy dead-end lattice	4	5.0	41.0	80.0
Tangent H-frame tubular steel	2	6.0	25.0	57.0
Angle H-frame tubular steel	2	7.0	30.0	77.0
Dead-end H-frame tubular steel	2	8.0	40.0	100.0
Guyed V	1/4	~5.0	~15.0	20.0
Guyed Delta	1/4	~5.0	~15.0	20.0

Depending on soil and tubular-steel structure type, the 345kV foundations would be either drilled-pier foundations or directly embedded. Typically, the tangent (no line angle change) 345kV single-circuit H-frame structures are directly embedded into the ground and do not require concrete foundations. The embedment depth is typically 10 percent of the pole length plus 5 feet. The diameter of the hole excavated for embedment is typically the pole diameter plus 18 inches. When a pole is placed in a hole, native or select backfill would be used to fill the voids around the perimeter of the hole.

Monopole 345kV single- and double-circuit structures would use a drilled-pier foundation. The foundation diameter and depth would be determined during final design and are dependent on the type of soil or rock present at each specific site. Typical foundation diameters and depths for the single-circuit and double-circuit mono-pole structure families are shown in Table 2.

Table 2
Typical 345-kilovolt Structure Type Foundations

Structure Type	Number of Foundations	Foundation Diameter (feet)	Foundation Depth (feet)	Area of All Foundations (square feet)
Single Circuit				
Tangent H-frame	2	4.0	18.0	26.0
Tangent monopole	1	7.0	24.0	39.0
Small angle monopole	1	7.5	26.0	45.0
Medium dead-end lattice	1	4.0	20.0	13.0
Heavy dead-end lattice	1	4.0	25.0	13.0
Double Circuit				
Tangent monopole	1	8.5	32.0	57.0
Small angle monopole	1	9.0	34.0	64.0
Medium dead-end monopole	1	10.5	40.0	87.0
Heavy dead-end monopole	1	12.0	45.0	114.0

2.2 Conductors

2.2.1 Conductors for Segments 1, 2, and 3

The proposed conductor for the self-supported 500kV lines as well as the guyed steel 500kV lines is 1272 kcmil ACSR triple bundled "Bittern." For all 500kV lines, each phase of the three-phase circuit[2] would be composed of three sub-conductors in a triple bundle configuration. The triple-bundled configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference as compared to a single large-diameter conductor. Each 500 kV sub-conductor would have a 45/7 aluminum/steel stranding, with an overall conductor diameter of 1.345 inches and a weight of 1.432 pounds per foot and a nonspecular finish[3].

2.2.2 Conductors for Segments 4a and 4b

The proposed conductor for the 345 kV lines, (Segments 4a, and 4b) is 1,272 kcmil 45/7 ACSR “Bittern.” Each phase of the 345kV three-phase circuit would be composed of two sub-conductors. The individual 1,272 kcmil conductors would be bundled in a vertical configuration with spacing of 18 inches. The double-bundle configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference when compared to a single large-diameter conductor. Each 345kV conductor would have 45/7 aluminum/steel stranding, with an overall conductor diameter of 1.345 inches and a weight of 1.432 pounds per foot and a nonspecular finish.

2.2.3 Conductors for Segment4c

The proposed conductor for the relocated Mona – Huntington 345kV transmission line loop into Clover Substation (Segments 4c) is 954 kcmil 54/7 ACSR “Cardinal.” Each phase of the 345kV three-phase circuit would be composed of two sub-conductors in a double-bundle configuration. The individual 954 kcmil conductors would be bundled in a vertical configuration with spacing of 18 inches. The double-bundle configuration is proposed to provide adequate current carrying capacity and to provide for a reduction in audible noise and radio interference when compared to a single large-diameter conductor. Each 345kV conductor would have 54/7 aluminum/steel stranding, with an overall conductor diameter of 1.196 inches and a weight of 1.229 pounds per foot and a nonspecular finish.

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[2] For transmission lines, a circuit consists of three phases. A phase may consist of one conductor or multiple conductors (i.e., sub-conductors) bundled together.

[3] Nonspecular finish refers to a “dull” finish rather than a “shiny” finish.

2.3 Other Hardware

2.3.1 Insulators

As shown in Figures 2 through 9, insulator assemblies for both the 345kV and 500kV tangent structures would consist of two strings of insulators in the form of a “V” or a single string of insulators in the form of an “I.” The V shaped configuration of the insulators restrains the conductor bundle from excessive swing into the structure in high winds allowing a more compact phase separation. The I-shaped configuration is hung vertically from the cross arm, arm, bridge or cross rope cable in the form of an “I” and is subject to higher swing angles in high winds than the “V.” Dead-end insulator assemblies for both 345kV and 500kV lines would use an I-shaped configuration in the horizontal position on both the ahead and back span sides of the structure, which consists of insulators suspended from either a structure dead-end cross arm or bridge in the form of a horizontal “I.” The conductor from the ahead and back span sides of the structure is connected from either of the horizontal I-shaped configuration, through an I-shaped configuration insulator or “jumper” in the vertical position, to the horizontal I-shaped configuration on the opposite side of the structure. Tangent structures utilize three (3) insulator assemblies where dead-end structures consist of nine (9) total I-shaped insulator strings: six (6) in the horizontal position and three (3) in the vertical position. Insulators would be composed of porcelain, toughened glass or polymer.

2.3.2 Grounding Systems

A grounding system would be installed at the base of each transmission structure that would consist of copper ground rods embedded into the ground in immediate proximity to the structure foundation and connected to the structure by a buried copper lead. When the resistance to ground for each transmission structure would be greater than 15 ohms with the use of ground rods, counterpoise would be installed to lower the resistance to 15 ohms or less. Counterpoise consists of a bare copper-clad or galvanized-steel cable buried a minimum of 12 inches deep, extending from structures (from one or more legs of structure) for approximately 200 feet within the right-of-way. During final design of the transmission line segments, appropriate electrical studies would be conducted to identify the issues associated with paralleling other facilities and the types of equipment that would need to be installed (if any) to mitigate the effects of the induced currents. In extremely rare situations where the soil conditions are nonresistant, the buried copper lead may need to be extended outside of the right-of-way. Coordination with the agencies would occur in these instances.

2.3.3 Minor Additional Hardware

In addition to the conductors, insulators, and overhead shield wires, other associated hardware would be installed on the structure as part of the insulator assembly to support the conductors and shield wires. This hardware would include clamps, shackles, links, plates, and various other pieces composed of galvanized steel and aluminum.

Other hardware that is not associated with the transmission of electricity may be installed as part of the Project. This hardware may include aerial marker spheres or aircraft warning lighting as required for the conductors or structures per Federal Aviation Administration (FAA) regulations.[4] Structure proximity to airports and structure height are the determinants of whether FAA regulations would apply based on an assessment of wire/structure strike risk.

2.3.4 Potential for Cathodic Protection

When a high-voltage, alternating-current transmission line runs in parallel with a steel pipeline for a considerable length, significant voltages can be induced onto the pipeline. This alternating-current interference can result in damage to the pipeline coating and/or damage to the pipeline's wall. The Company's preference is to separate the proposed transmission line from the existing pipeline wherever possible. The Company and the applicable federal land-managing agency would work collaboratively to adjust the alignment to achieve an appropriate separation between existing pipelines and agency-preferred alternative route where needed, balancing the technical factors with sensitive environmental concerns.

Mitigative techniques can control induced voltages on an influenced pipeline and, for this existing condition of this project, the two mitigation techniques with most potential are as follows:

(1) Installation of parallel wires (zinc ribbons) bonded to the pipeline at regular intervals (to disperse the current away from the pipeline). As we understand it, installation of the ribbon requires excavation of a trench (approximately 24 inches wide and 36 inches deep) parallel to the pipeline. The zinc ribbon is laid in the trench and, at regular intervals, the zinc ribbon is attached to the pipeline. We understand that the surface disturbance associated with the trenching activities is about 11 feet wide. If there are multiple parallel pipelines in a corridor, a zinc ribbon would have to be installed for each. The zinc ribbon would have to be replaced approximately every 15 years.

(2) Locating the proposed transmission line to provide a greater separation between the existing pipeline and proposed transmission line. As an example, a separation distance of approximately 2,000 feet has been tentatively estimated by Questar Pipeline Company in the Uinta Basin area; however, determining the interference effects on the pipeline requires complex calculation of transmission line and pipeline electrical characteristics, electrical system parameters, and accurate representation of the soil structure (soil resistivity) to understand requirements for prudent separation. These studies would be conducted as the transmission line and access roads are designed and engineered.

As noted above, in order to avoid the additional surface disturbance associated with installation of the zinc ribbon, the preference is to separate the proposed transmission line from the existing pipeline.

2.4 Communications Systems

2.4.1 Optical Ground Wire

Reliable and secure communications for system control and monitoring of Gateway South is very important to maintain the operational integrity of the Project and of the overall interconnected system. Primary communications for relaying and control would be provided via the optical ground wire (OPGW), for the Company's operation of the transmission system, which would be installed on the transmission lines. For the 500kV transmission lines, a secondary communications path would be provided by the Company’s existing microwave system, which is currently installed from the Central Wyoming area to existing substations in central Utah. A secondary communications path also may be developed using a power line carrier for the Company’s operation of the transmission system. No new microwave sites are anticipated for the Project. Updated microwave equipment may be installed at existing sites and at the substations.

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[4] U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular AC 70/7460-1K Obstruction Marking and Lighting, August 1, 2000; and Advisory Circular AC 70/7460-2K Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace, March 1, 2000.

Each structure would have two lightning-protection shield wires installed on the peaks of each of the 500kV single-circuit lattice-steel and H-frame structures. On the 345-kV H-frame structures, these lightning-protection shield wires would be installed at the top of each pole. On both the 500kV and 345kV transmission lines where communication is required, one of the shield wires would be composed of extra-high-strength-steel wire with a diameter of 0.5 inch and a weight of 0.517 pound per foot. The second shield wire would be an OPGW constructed of aluminum and steel, which carries 48 glass fibers within its core. The OPGW would have a diameter of 0.64 inch and a weight of 0.375 pound per foot. The glass fibers inside the OPGW shield wire would provide optical data transfer capability among the Company’s facilities along the fiber path for the Company’s operation of the transmission system. The data transferred are required for system control and monitoring. On lines where communication is not required, both of the shield wires would be composed of the extra-high-strength steel wires. For Gateway South, all 500kV line segments would be designed to carry an OPGW. For the 345kV lines, Segment 4a would be designed to carry an OPGW.

2.4.2 Regeneration Stations

As the data signal is passed through the optical fiber cable, the signal degrades with distance. Consequently, signal regeneration stations are required to amplify the signals if the distance between substations or regeneration stations exceeds 55 miles. The exact locations cannot be determined at this time and would be based on the selected route.

A regeneration station may be housed within a substation control house in those cases where a substation is located along or near the final transmission route at an appropriate milepost. Otherwise, land must be obtained. Where a new site is required, the typical site would be 100 feet by 100 feet, with a fenced area of 75 feet by 75 feet. A 12-foot- by 32-foot- by 9-foot-tall building or equipment shelter (metal or concrete) would be placed on the site, and access roads to the site and power from the local electric distribution circuits would be required. An emergency generator with a liquid-petroleum-gas-fuel tank would be installed, in compliance with current regulations, at the site inside the fenced area. Two diverse communication cable routes (aerial and/or buried) from the transmission right-of-way to the equipment shelter would be required. Figure 10 illustrates the plan arrangement of a typical regeneration station.

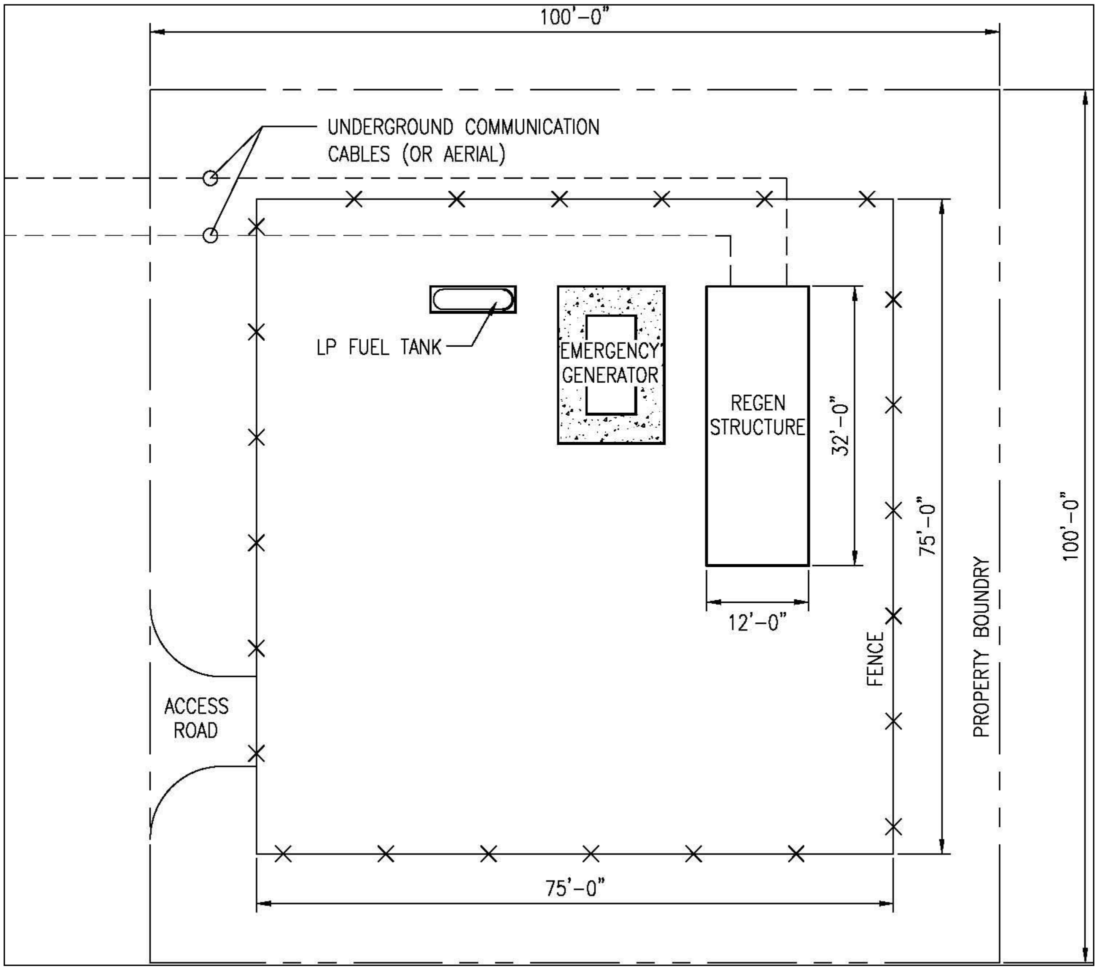


Figure 10 Typical Regeneration Station Site

2.5 Access to the Right of Way

Access to the right-of-way is an essential part of the construction and operation of the Project. Large foundation auger equipment, heavily loaded trucks, cranes, and specialized transmission-line construction equipment would be required for construction, maintenance, and emergency restoration activities. Annual ground-based inspections require vehicular access using four-wheel-drive trucks or four-wheel-drive all-terrain vehicles (ATVs) to each structure site. Section 4 (System Operation and Maintenance) describes in detail operational requirements.

During construction, vehicular access would be required to each structure. New access would be constructed and existing pathways widened as needed. Access not required after construction would be restored to the original condition or left as is, depending on landowner or land-management agency requirements.

Access construction employs heavy equipment including bulldozers, front-end loaders, dump trucks, water trucks, backhoes, excavators (both tracked and rubber-tired), and graders. Other specialized equipment, including boom trucks to install culverts in some areas, would be used where needed. Access would be built to provide a stable, permanent minimum 14-foot-wide travel surface. Depending on the side slope, disturbance width would be larger than 14-feet and can include cuts and fills, crowning and ditching, at-grade water bars, and various kinds of water-body crossings.

The largest of the heavy equipment needed, which dictates the minimum-needed road dimensions, is a truck-mounted aerial-lift crane 100,000 pounds gross-vehicle-weight eight-wheel-drive, 210-foot telescoped boom. Vehicle width is 8feet 6 inches (102 inches) or less and wheelbase is approximately 40 feet. To accommodate this equipment, the road specifications require a minimum 14-foot-wide road top (travel way) with minimum 16- to 22-foot-wide road width in turns. The required access disturbance area and travel way in areas of rolling to hilly terrain would require a wider disturbance to account for cuts and fills, or where vehicles are required to pass one another while traveling in opposite directions.

During routine operations (by four-wheel-drive truck and ATVs), vehicular access would be needed to each structure for periodic inspections and maintenance and to areas of forest or tall shrubs to control vegetation in the right-of-way for safe operation. In an emergency (i.e., in the event of a structure or conductor failure) full emergency access, including cranes and other heavy equipment, would be needed. Based on historical reliability of lattice structures and conductors, it is anticipated that only a small fraction of the structure sites would require emergency access over the life of the Project.

Following are access types anticipated to be used and or developed for the Project. The Company's typical water-body crossings standards are included as Attachment A of this appendix, Rocky Mountain Power's Transmission Construction Standard TA501.

Existing Roads – No Improvement: The Existing Roads – No improvement access-road type includes existing paved or all weather surfaced roads that meet the Company's construction road standards. The Company's construction-road standards include the use of a minimum travel surface width of 14 feet and require a travel-surface width of up to 22 feet depending on the radius of curves.

The Existing Roads - No Improvement access-road type includes existing maintained paved or all-weather surfaced roads that are able to be used in their current condition. The use of the term 'No-Improvement' is intended to signify that no additional new disturbance would be created outside of an established disturbed area. As such, the Existing Roads - No Improvement access-road type could include regular maintenance to make the road passable for construction. Regular maintenance could include, but is not limited to, minor blading activities, repair of washed out areas, wash-boarded areas, depressions requiring graveling, approach installation, and other minor improvements.

Existing Roads – Improvements Required: The Existing Roads - Improvements Required access-road type includes existing roads that require improvements to meet the Company's construction-road standards. The Existing Roads - Improvements Required access-road type includes existing roads that may require widening to a minimum 14 foot travel-surface width to meet the Company's construction-road standards. In areas of steep terrain, the road travel-surface width could be a maximum of 22 feet to meet the Company's construction-road standards, depending on radius of curves and the slope of the terrain. As a result, total disturbance has the potential to exceed 22 feet, depending on the slope of the terrain. Disturbed areas, as a result of cut-and-fill slopes, would exceed the travel-surface width in areas of steep terrain.

Improvements to this access-road type could include, but are not limited to, blading to create a road to meet the Company's construction-road standards, cut-and-fill activities, re-establishing drainage features, tree removal, boulder and rock removal, bridge and culvert construction, installation of wash crossings, and other improvements to provide an adequate surface to support construction and maintenance vehicles.

Improvements to this access-road type may require reclamation to preconstruction conditions as determined by the land-management agency requirements or landowner requirements.

New Roads - Bladed: The New Roads – Bladed access-road type includes the construction of new permanent access roads where existing roads do not exist with the purpose of allowing for access to the Project right-of-way. New bladed access roads would be constructed to meet the Company’s construction-road standards. The Company’s road-construction standards include constructing a minimum travel-surface width of 14 feet. In areas of steep terrain, the road travel-surface width could be a maximum of 22 feet to meet the Company’s construction-road standards, depending on radius of curves and the slope of the terrain. As a result, total disturbance has the potential to exceed 22 feet, depending on the slope of terrain. Disturbed areas, as a result of cut-and-fill slopes, would exceed the travel-surface width in areas of steep terrain.

New Roads – Overland Travel: The New Roads – Overland Travel access-road type includes new permanent access routes that would use Overland Travel with the purpose of allowing for access to the Project right-of-way. It is intended that Overland Travel access is used in areas where access can be attained without construction of roads according to the Company’s access road standards. As such, overland travel would be used in areas of relatively flat topography. The result would be an access route that eventually would become a two-track trail or naturally revegetate completely, but still allow the Company’s access without grading after construction.

Overland travel comprises the following two different methods:

- **Drive and Crush**, which is vehicular travel to access a site without significantly modifying the terrain. Vegetation is crushed, but not cropped, soil is compacted but no surface soil is removed. Even though vegetation may be damaged or destroyed, this creates vertical mulch on the surface soil and leaves the seed bank in place. Crushed vegetation would likely resprout after temporary use is stopped. A dozer, grader, or other type of equipment may be used to move boulders or other obstructions that prevent overland travel. Additionally, minor areas where the planned access crosses a side slope that exceeds the allowable slope for access by construction or maintenance vehicles, may be graded to provide safe passage. The disturbed area would be blended, to the extent practicable, into the existing grades and revegetated according to the prescribed mitigations.

- **Clear and Cut**, which is considered as above-grade removal of vegetation in order to improve or provide suitable access for equipment. All vegetation is removed using above-grade cutting methods that leave the root crown intact. Soils are compacted, but no surface soil is removed. A dozer, grader, or other type of equipment may be used to move boulders or other obstructions that prevent overland travel. Additionally, minor areas where the planned access crosses a side slope that exceeds the allowable slope for access by construction or maintenance vehicles, may be graded to provide safe passage. The disturbed area would be blended, to the extent practicable, into the existing grades and revegetated according to the prescribed mitigations.

Temporary Roads: The Temporary Roads access-road type is the temporary construction or use of roads to access a site and can include existing trails or two-track roads or overland travel access to support the construction of the Project and access the Project right-of-way. This access-road type may not require construction to meet the Company’s road-construction standards. However, this access road type would be constructed to provide a safe travel way and, as such, temporary disturbance could result. Temporary disturbance would be dictated by the underlying ground conditions, but disturbance could range from significant, such as blading/cut and fill activities, to minor, such as overland travel.

Unless otherwise noted by the land-management agency or landowner, this access-road type requires reclamation, to the extent practicable, to preconstruction conditions.

2.6 Series Compensation Substations

As mentioned in Section 1.2 of this appendix, two series compensation substations are planned. They are required to improve the transport capacity and efficiency of the transmission line. Locations for the stations have not been identified, as of the date of this Draft EIS; however, they would be located approximately one-third (Series Compensation Station No. 1) and two-thirds (Series Compensation Station No. 2) of the distance from the Aeolus Substation to the Clover Substation. The Company's preference is to site each series compensation station in-line with the transmission line. However, if directly routing the line through the station is precluded because of potential conflict with station site requirements, land use(s), or sensitive environmental resource, the line would diverge from centerline (but remain within a 4-mile-wide area) to provide a connection into and out of the series compensation station.

The following sections describe key components of series compensation substations.

2.6.1 Bay

A substation "bay" is the physical location within a substation fenced area where the high-voltage circuit breakers and associated steel transmission line termination structures, high-voltage switches, bus supports, controls, and other equipment are installed. For the 500kV transmission line, circuit breakers, high-voltage switches, bus supports, and transmission line termination structures typically would be installed. The tallest structures in the substations would be the 500kV dead-end structures, which vary in height from approximately 70 to 135 feet, and/or a microwave antenna tower, which would be 100 feet or more depending on the height needed to maintain line of sight to the nearest microwave relay site. Additional equipment including 500kV transformers and 500kV shunt reactors (which resemble a transformer in appearance), and 500kV shunt-capacitor banks would be installed.

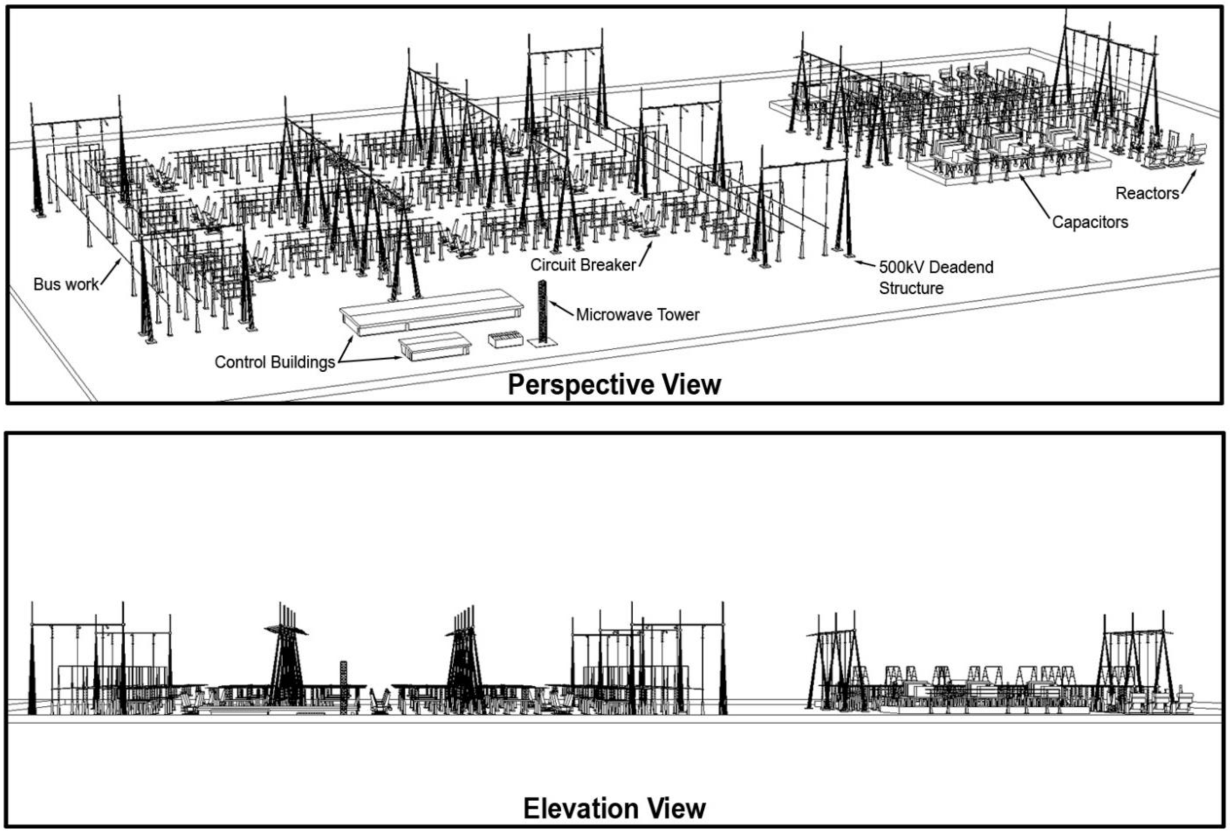
Figure 11 is a perspective sketch illustrating the appearance of a typical 500kV substation with multiple line connections.

2.6.2 Access Road

Permanent all-weather access roads are required at the series compensation substation sites to provide access for personnel, material deliveries, vehicles, trucks, heavy equipment, low-boy tractor trailer rigs (used for moving large transformers), and ongoing maintenance activities at each site. Substation access roads are normally well-compacted, graded gravel roads approximately 20 feet wide with a minimum 110-foot turning radius to accommodate the delivery of large transformers to the site. New access roads would be developed from public roads to the two series compensation substations.

2.6.3 Control Building

One or more control buildings are required at each substation to house protective relays, control devices, battery banks for primary control power, and remote monitoring equipment. The size and construction of the building depends on individual substation requirements. Typically, the control building would be constructed of concrete block, pre-engineered metal sheathed, or composite surfaced materials. Special control buildings may be developed within the series compensation substation developments to house other control and protection equipment.



Perspective View

Elevation View

Figure 11 Typical 500-kilovolt Substation

2.6.4 Fencing

Security fencing would be installed around the entire perimeter of each series compensation substation to protect sensitive equipment and prevent accidental contact with energized conductors by third parties. This 7-foot-high fence would be constructed of chain link with steel posts, with 1 foot of barbed wire above the chain link and with locked gates.

2.6.5 Distribution Supply Lines

Station-service power would be required at each substation or regeneration station. Typically, station-service power is provided from a local electric distribution line, located in proximity to the substation or regeneration station. The voltage of the distribution supply line is typically 34.5kV or lower and carried on wood poles. For all new substations sites, it would be necessary to extend the electric distribution line from a suitable take-off point on the existing distribution line to the new Gateway South substation site or regeneration station. The location and routing of the existing distribution lines to the new substation sites would be determined during the final design process. Modifications to the existing distribution facilities may be necessary to provide increased capacity to support the expansions at the existing substation sites.

3 SYSTEM CONSTRUCTION

The following section and subsections describe land requirements and construction activities for the Project, including transmission line, series compensation substations, communication, and associated ancillary features.

All construction would be completed in accordance with the Project Construction Plan of Development (POD), which would be required as a condition of any federal land-use authorization (e.g., right-of-way grant, special-use permit, license agreement). The stipulation that the Construction POD should be completed prior to the issuance of a Notice to Proceed would be incorporated into such land-use authorization. The Construction POD will include such documents as:

- Traffic and Transportation Management Plan
- Stormwater Pollution Prevention Plan Framework
- Spill Prevention, Containment, and Countermeasures Plan Framework
- Historic Property Treatment Plan
- Blasting Plan Framework
- Plant and Wildlife Species Conservation Measures Plan
- Erosion, Dust Control, and Air Quality Plan
- Hazardous Materials Management Plan Framework
- Emergency Preparedness and Response Plan Framework
- Noxious Weed Management Plan
- Fire Protection Plan
- Stream, Wetland, Well, and Spring Protection Plan
- Paleontological Resources Treatment Plan
- Reclamation, Revegetation, and Monitoring Framework Plan

The Construction POD also will include more detailed descriptions of construction activities and requirements.

3.1 Land Requirements and Disturbance

3.1.1 Right-of-Way Width

The Company proposes to acquire a permanent 250-foot-wide right-of-way for the 500kV single-circuit sections of the Project, and a 150-foot-wide right-of-way for the 345kV single-circuit Segment 4c of the Project. Segments 4a and 4b would be in existing right-of-way. The determination of these widths is based on two criteria:

- Sufficient clearance in the span between support structures to obstacles outside the right-of-way must be maintained during a high wind event when the conductors are blown towards the right-of-way edge.

- Sufficient room must be provided within the right-of-way at the support structures to perform transmission line maintenance. See Subsection 4.1 of this document for details of maintenance requirements.

During construction, temporary permission and/or right-of-way would be required from landowners and land-management agencies during construction of temporary components of the Project such as multi-purpose construction yards and helicopter fly yards. During operation, Project land requirements would be restricted to the right-of-way, access roads, series compensation substations, and communication facilities. Access to the right-of-way would be in accordance with the land rights obtained as part of the grant or easement acquisition process. As further details of the final Project design are engineered, the amount of land required may change.

3.1.2 Right-of-Way Acquisition

Rights-of-way for transmission line facilities on private lands would be obtained as perpetual easements. Land for series compensation substations or regeneration stations would be obtained in fee simple where located on private land. Every effort would be made to purchase the land and/or obtain easements on private lands through reasonable negotiations with the landowners. All negotiations with landowners would be conducted in good faith, and the Project’s effect on the parcel or any other concerns the landowner may have would be addressed.

In order to achieve the capacity needed to serve present and future loads within the Company’s service areas, the North American Electricity Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability standards require minimum separation from existing transmission lines that serve substantially the same load as that served by each of the new Gateway South transmission segments. In these cases, it is the Company’s minimum separation guideline that the Gateway South transmission line be located at least 250 feet from the nearest existing 230kV or higher-voltage transmission lines or at least 300 feet from planned high-voltage transmission lines. Land between rights-of-way that are separated to meet reliability criteria would not be encumbered with an easement, but could be limited in some land uses due to the proximity of two or more large transmission lines.

3.1.3 Land Disturbance

Table 3 includes disturbance dimensions of land from construction and operation activities for the Project.

Table 3
Summary of Land Disturbance Required for Construction and Operation of the 500- and 345-kilovolt Transmission Lines

Feature	Description
500kV Transmission Line	
Line length	Approximately 400 to 540 miles (depending on route selected)
Span length	Self-supporting steel-lattice 1,000 to 1,500 feet
	H-frame 1,200 to 1,300 feet
	Guyed steel-lattice 1,000 to 1,800 feet
Structures per mile	Self-supporting steel-lattice approximately 4 to 5
	H-frame approximately 4
	Guyed steel-lattice approximately 3 to 4
Right-of-way width	250 feet
Land Temporarily Disturbed	
Structure work area	250 by 250 feet per structure
Wire-pulling/tensioning	250 by 400 feet; two every 3 to 5 miles

Table 3
Summary of Land Disturbance Required for Construction and Operation of the 500- and 345-kilovolt Transmission Lines

Feature	Description
Splicing sites	100 by 100 feet every 9,000 feet
Guard structures	150 by 75 feet; approximately 1.4 structures per 1 mile
Multi-purpose construction yards	30-acre site located approximately every 20 miles on private and/or public land (locations to be determined) [1]
Helicopter fly yards	15-acre site located approximately every 5 miles[2]
Access roads (improve existing, spur, and new)	Improve existing, spur, and new roads would be a minimum of 14-foot-wide travel surface (in steeper terrain the travel surface width could be a maximum of 22 feet for radius of curves) plus disturbance for grading and drainage features (total distance to be determined)
Land Permanently Required	
Area occupied by structure (pad)	0.08 acre per structure (guyed and self-supporting)
Series compensation stations	Two at 160 acres each
Communication regeneration station	100 by 100 feet with 75- by 75-foot fenced areas and a 12- by 32-foot building; one station approximately every 55 miles
Access roads (improve existing, spur, and new)	Improved existing, spur, and new roads would typically have a 14-foot-wide travel surface (in steeper terrain the travel surface width could be a maximum of 22 feet for radius of curves) plus disturbance for grading and drainage features (total distance to be determined)
345kV Transmission Lines[3]	
Line lengths	Three segments totaling approximately 6.6 miles
Span length	H-frame 800 to 1,200 feet
	Single- and double-circuit mono-pole – 700 to 800 feet
Structures per mile	H-frame approximately 4 to 7 per mile
	Single- and double-circuit mono-pole approximately 6 to 8 per mile
Right-of-way width	Segments 4a and 4b on existing right-of-way, Segment 4c 150 feet
Land Temporarily Disturbed	
Structure work area	150 by 200 feet per structure
Wire-pulling/tensioning	150 by 400 feet; one site per 345kV segment
Splicing site	100 by 100 feet; one site for segments 4a and 4b
Guard structures	150 by 75 feet approximately 1.4 structures per 1 mile
Multi-purpose construction yards	10-acre site; one site located near Clover Substation
Helicopter fly yard	15-acre site located near Clover Substation (location to be determined)[2]
Access roads (improve existing, spur, and new)	Improve existing, spur, and new roads would be 14 feet wide
Land Permanently Required	
Area occupied by structure (pad)	5 by 40 feet per structure (H-frame)
Access roads (improve existing, spur, and new)	Improve existing, spur, and new roads would be 14 feet wide

NOTES:

[1] Multi-purpose construction yards include concrete batch plants, which would occur approximately every 60 miles except in areas where the Project could be serviced by existing concrete batch plants. Helicopter landing and refueling also would occur in the multi-purpose construction yards.

[2] Helicopter fly yards, which are used to transport materials to structure work areas during construction, also may include space dedicated for refueling helicopters.

[3] Engineering details regarding the relocation and structure types will be completed upon approval of a final route in the Record of Decision and right-of-way grant.

3.2 Transmission Line Construction

The following sections describe the transmission-line construction activities and procedures for Gateway South. Figure 12 illustrates the transmission line construction sequence. Substation construction is described in Subsection 2.4 of this appendix. Various construction activities would occur during the construction process, with several construction crews operating simultaneously at different locations on three transmission line segments (spreads).

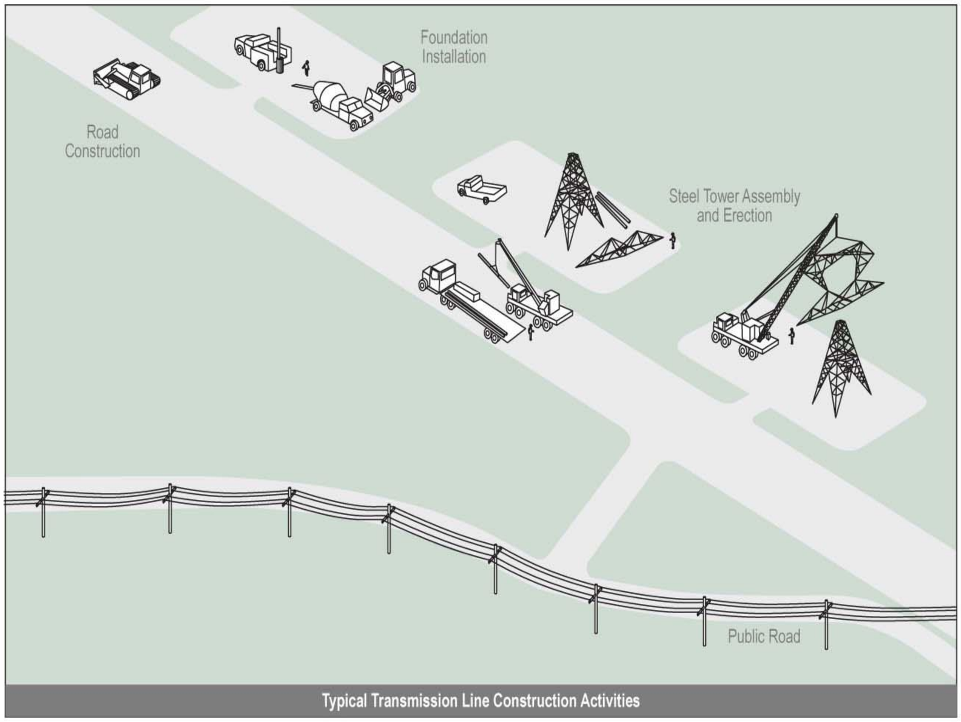

Foundation Installation
Road Construction
Steel Tower Assembly and Erection
Public Road
Typical Transmission Line Construction Activities

Figure 12 Transmission Line Construction Sequence

Approximately 400 to 540 miles (depending on alternative route selected) of 500kV transmission lines and associated support structures would be constructed, between Aeolus Substation and Clover Substation. Less than 10 miles of three segments (Segments 4a, 4b, and 4c) would be 345kV construction between the Clover and Mona substations.

3.2.1 Transmission Line System Access

Construction of the 500kV and 345kV transmission lines would require vehicle, truck, and crane access to each new structure site for construction crews, materials, and equipment. Similarly, construction of other Project components such as staging yards and substation sites would require vehicle access.

Transmission line right-of-way access would be a combination of new access, improvements to existing access, and use of existing access as is. New access or improvements to existing access would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or off site. Typically, access to the transmission line right-of-way and structure sites requires a 14-foot-wide travel way for straight sections and a 16- to 22-foot-wide travel way at curves to facilitate safe movement of equipment and vehicles. However, in certain areas, access widths through curves may exceed 22 feet. Wherever possible, new access would be constructed within the proposed transmission line right-of-way, or existing access would be used. In other cases, access would be required between the proposed transmission line and existing access. Erosion control and sedimentation measures such as crossroad drainage, at-grade water bars, culverts, sediment basins, or perimeter control would be installed as required to minimize erosion during and subsequent to construction of the Project.

After Project construction, existing and new permanent access would be used by maintenance crews and vehicles for inspection and maintenance activities. New access created to construct structures would be revegetated only. Temporary construction access not required for future maintenance would be restored after completion of Project construction. For example, access to multi-purpose yards (see description below) would not be required once the yard is regraded and vegetated. Gates (or other barriers) would be installed as required to restrict unauthorized vehicular access to the right-of-way. Access retained for operations would be seeded with a seed mix required by the agencies and allowed to revegetate. For normal maintenance activities, an 8-foot-wide portion of access would be used and vehicles would drive over the vegetation. For nonroutine maintenance requiring access by larger vehicles, the full width of the access may be used. Access areas would be repaired, as necessary, but not be routinely graded. Vegetation (e.g., taller shrubs and trees) that may interfere with the safe operation of equipment would be managed on a cyclical basis.

3.2.2 Geotechnical Investigations within the Right-of-way

The purpose of the geotechnical investigation is to perform tests and collect samples to aid in preparation of soil parameters to be used in the final design of structure foundations. This activity is necessary help ensure the system is designed and constructed to be safe, reliable, cost efficient, and can reduce the overall temporary and permanent land disturbance within the right-of-way during initial build and the life of the Project.

The geotechnical investigations would consist of the drilling and sampling of soils to a typical depth of 50 to 60 feet below the existing ground. The borehole depth may exceed 60 feet if soil conditions indicate. The boreholes would have a diameter of approximately 8 inches and typically would be backfilled with auger cuttings and on-site soils. Access roads and overland access routes as designed for the final right-of-way grant would be used exclusively.

Helicopter and/or manually transported drill rigs may be used for geotechnical exploration in areas where existing roads do not provide adequate access or where overland travel is prohibited. Geophysical exploration techniques would be employed to assist in subsurface characterization. Geophysical techniques cannot replace drilling. One form of geophysical testing, refraction microtremor (ReMi) uses instrumentation combined with surface actuation to identify subsurface soil and rock stratification. The actuation can be low impact, such as a person jumping up and down. However, a larger actuation, such as that produced by a hammer striking a steel plate lying on the ground, provides more detail in the testing.

The geotechnical investigation would be conducted at both substation/series compensation locations and along the transmission line right-of-way. A description of activities is provided below broken down by facility and type of drilling to accomplish the geotechnical investigation.

The geotechnical exploration program for the transmission line planned according to the Company's standard TA 071. Explorations are specified at all planned angle points and dead-ends, intervals not to exceed 3 miles in long tangent sections of the line, and any additional locations needed to address areas of concern identified in the Geotechnical Desktop Report. The geotechnical exploration for this Project is anticipated to consist of site examinations, access to the bore site by a drill rig and support vehicles, geotechnical drilling, down-hole geotechnical testing, select geophysical surveys, and laboratory testing. In general, drilling depths are anticipated to be 50 to 60 feet. If competent bedrock is encountered, coring would be advanced 5 to 15 feet into competent rock. Access to the boreholes would be made along routes selected and analyzed in the Project EIS. All disturbance associated with the geotechnical exploration program is to be contained completely within the area analyzed for disturbance associated with the transmission line construction.

GEOTECHNICAL DRILLING ACTIVITIES

Anticipated drilling methods to accomplish the exploration depths described above include the following.

Hollow Stem Auger Drilling

Auger drilling consists of rotating a hollow drill stem to advance a toothed bit into the subsurface materials. The materials are brought up from the borehole by the rotation of a continuous helical fin on the outside of the drill stem. The drill stem is added in pieces (flights) as the boring advances downward. This is a dry method of drilling that typically requires no water, drilling mud, or pressurized air as a circulating fluid. The support equipment for auger drilling includes a water truck, either truck or track mounted, and the geologist/engineer's vehicle.

Mud Rotary Drilling

Mud rotary drilling consists of rotating a smooth-walled hollow drill stem and advancing a variety of drill bits at the end of the drill stem. The materials are brought up from the borehole by pumped water, typically travelling down through the drill stem, out the bit, and flowing up the outside of the drill stem. The drilling mud and/or water pumped through the rods carries drill cuttings to the ground surface. A tub at the surface collects the drill cuttings and holds the water for recirculation. The equipment for mud rotary drilling includes the drill rig, a support vehicle for rods and equipment, a water truck, and the geologist/engineer's vehicle.

Air Rotary Drilling

The air rotary drilling method is similar in principle to mud rotary drilling. However, this method uses compressed air as the circulating medium rather than water or mud slurry. Drill cuttings are retrieved from under a hood placed over the borehole or a cyclone. A special type of air rotary drilling involves the use of an air hammer. Compressed air is pumped through the drill pipe to an air hammer bit in the borehole. The pneumatic bit strikes the rock very rapidly. The equipment for air rotary drilling includes the drill, a support vehicle with drilling steel towing an air compressor, and the geologist/engineer's vehicle.

Sonic Drilling

Sonic drilling uses a rotating drill string as with other drilling methods; however, this method uses a sonic drill head to impart a high-frequency vibration on the drill stem and open pipe casing/core barrel that is advanced into the subsurface materials. As the casing is advanced, soil and rock samples are forced up into the casing, providing a continuous sample of the subsurface soil and rock. The frequency of vibration can be changed to match the subsurface conditions, making this type of drilling generally faster than the other drilling methods. Sonic drills are normally mounted on larger transport vehicles. The support equipment for sonic drilling included a vehicle to carry the drill, a support vehicle for rods, and the geologist/engineer’s vehicle.

Under-Reamer Type Drilling (ODEX System)

The under-reamer drilling method uses tooling in which an outer drill casing is advanced along with the drill bit (more or less simultaneously, depending on the manufacturer). The drill bit has a section that moves outward through eccentric action when the drill rods are rotated, thereby making the borehole larger than the casing. The larger-diameter hole allows the casing to follow along behind the bit by being hammered or pushed as the hole is drilled. The bit is typically a tungsten carbide button bit that is driven by a percussion air hammer during rotation. A common name for this type of drilling is ODEX, which is an acronym for overburden drilling with eccentric bit. Drill cuttings are removed by compressed air travelling down the drill rod to the bit and returning via the annulus between the drill rod and casing lifting the cuttings to the surface. The air path can be reversed similar to the method used by reverse circulation drilling. The support equipment for under-reaming drilling includes an air compressor, a support vehicle to carry casing, and the geologist/ engineer’s vehicle.

Cone Penetration Test Drilling

The cone penetration test (CPT) is a testing method used to determine the engineering properties of soils and delineate soil lithology. The test method consists of pushing an instrumented cone at a constant rate. The instruments measure tip (cone) resistance and friction resistance along the sides. The CPT delineates soil layers from the ratio of cone to side friction resistance. CPT drilling provides excellent geotechnical information in softer formations but typically reaches refusal in soils with gravel, medium dense sands or hard fine grained soils. The CPT drill typically is mounted in a box truck or on a track/all-terrain rig. The support equipment for CPT drilling includes a support truck for equipment, and the geologist/engineer’s vehicle.

Drilling Rig Types

The drilling equipment described above is commonly mounted on road-legal two-wheel-drive and four-wheel-drive trucks, tracked vehicles, an oversized-tire ATV, or on platform rigs. Platform rigs can be transported in pieces to the site via helicopter. Additionally, a man-portable drill rig may be used where access is not available. This rig type is transported, in pieces, as closely as possible to the borehole site using road-legal vehicles or off-highway vehicles. The pieces are packed into the site by personnel or livestock and assembled on site to perform the drilling. The type of drilling rig used is dependent on the access difficulties to the borehole location and the sampling methods required. Other vehicles and equipment normally mobilized to each boring location may include a water truck and/or support vehicle, large air compressor, geologist’s pickup truck or utility vehicle, and possibly another support truck. In some areas, earthwork equipment may be required to assist with access to the boring location. Tracked support vehicles including the water truck may be required. The drilling subcontractor must be equipped to provide drilling vehicles as demanded by access requirements and the terrain.

3.2.3 Multi-purpose Yards

Construction of Gateway South would begin with the establishment of multi-purpose yards along the Project alignment. The multi-purpose yards would serve as field offices; reporting locations for workers; parking space for vehicles and equipment; and sites for material storage, fabrication assembly, concrete batch plants, and stations for equipment maintenance. The yards, about 30 acres each for 500kV transmission-line construction and one 10-acre site in the Clover Substation area for 345kV transmission-line construction, would be located near each end of each segment of the transmission-line right-of-way, and approximately every 20 miles along the route. Additionally, helicopter fly yards for helicopter operations would be located approximately every 5 miles along the route where helicopter construction is planned, and would occupy approximately 15 acres each. Lighting would be the minimum required to meet safety and security standards.

Multi-purpose yards and helicopter fly yards may be fenced, have locked gates and may have security guards stationed where needed. Yard locations would be finalized following discussion with the land-management agency or negotiations with landowners. In some areas, the multi-purpose yards may need to be scraped by a bulldozer and a temporary layer of rock laid to provide an all-weather surface. Unless otherwise directed by the land-management agency or landowner, the rock would be removed from the yards upon completion of construction and the area would be restored.

Typically, helicopter fly yards would be located in relatively flat areas with easy, existing access to minimize site grading and new road construction. When possible, these areas would be located in previously disturbed sites or in areas of minimal vegetative cover.

3.2.4 Site Preparation

Individual structure work areas would be cleared to install the transmission-line support structures and facilitate access for future transmission line and structure maintenance. Clearing of individual structure work areas would be required to install the structures. Clearing individual structure sites would be done using a bulldozer to blade the required area, and to the extent practical, blading of native plant communities would be minimized. At each single-circuit 500kV structure location, an area approximately 250 feet by 250 feet would be needed for construction laydown, structure assembly, and erection at each structure site, depending on slope. An area approximately 150 feet by 200 feet would be required for 345kV structure locations. This area would provide a safe working space for placing equipment, vehicles, and materials. For all structure types, the structure work area would be cleared of vegetation only to the extent necessary and any removal of topsoil would be stockpiled and stabilized to limit erosion. After construction, all areas not needed for normal transmission line maintenance, including fire and personnel safety clearance areas, would be graded to blend as near as possible with the natural contours, topsoil replaced, then revegetated as required.

Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock. Excess rock that is too large in size or volume to be spread at the individual structure sites would be hauled away and disposed of at approved locations or at a location specified by the landowner.

3.2.5 Install Structure Foundations

Each 345kV H-frame typically would require the poles be directly embedded in the ground. Holes would be drilled in the ground using a truck- or track-mounted auger. When the pole is placed in the hole, native or select backfill would be used to fill the voids around the perimeter of the hole. When backfill must be imported, material would be obtained from commercial sources or from areas free of noxious weed species. Similarly, where solid rock is encountered, blasting may be required.

Each 345kV mono-pole support structure and 500kV steel H-frame structure would require the installation of foundations, which typically are drilled concrete piers. The holes would be drilled using truck- or track-mounted augers of various sizes depending on the diameter and depth requirements of the hole to be drilled. Each foundation would extend approximately 2 feet above the ground level.

Where solid rock is encountered, blasting, rock hauling, or the use of a rock anchoring or micro-pile system may be required. Micro-piles are high capacity, small diameter (5-inch to 12-inch) drilled and grouted in-place piles designed with steel reinforcement to primarily resist structural loading. The rock anchoring or micro-pile system would be used in areas where site access is limited or adjacent structures could be damaged as a result of blasting or rock-hauling activities.

In environmentally sensitive areas with very soft soils, additional equipment such as a HydroVac, which uses water pressure and a vacuum, may be used to excavate material into a storage tank. Alternatively, a temporary casing may be used during drilling to hold the excavation open, after which the casing is withdrawn as the concrete is placed in the hole. In areas where it is not possible to operate large drilling equipment due to access or environmental constraints, hand digging may be required.

Reinforced steel anchor-bolt cages would be installed after excavation and prior to structure installation. These cages are designed to strengthen the structural integrity of the foundations and would be assembled at the nearest multi-purpose yard and delivered to the structure site via flatbed truck or helicopter. These cages would be inserted in the holes prior to pouring concrete. The excavated holes containing the reinforcing anchor bolt cages would be filled with concrete.

LATTICE STEEL STRUCTURE FOUNDATIONS

Each 500kV support structures would require the installation of foundations. Excavations for the foundations would be completed using truck- or track-mounted equipment and/or augers of various sizes depending on the diameter and depth requirements of the hole to be drilled. Each foundation would extend approximately 2 feet above the ground level.

Self-supporting lattice towers will require four (4) foundations be installed, one for each leg of the tower. Foundations will be selected based upon geotechnical and geologic conditions. Foundation types include, drilled shaft concrete piers, shallow foundations, driven steel piles with a pile cap, steel screw piles with a pile cap, micropiles with a pile cap or steel grillages.
Excavations for shallow foundations will be completed using rubber tired or tracked conventional construction equipment. Excavation depth will be dependent on structure type, loading and soil conditions. For guyed structures the excavation will be prizmoidal, roughly 15 feet deep, 6 feet square at the top and 42 feet square at the bottom. A steel reinforced concrete footing would be cast against soil and a concrete pedestal would be cast to attach the tower to the foundation. The foundation will be backfilled using native soil compacted in small lifts.

Excavations for grillage foundations will be completed in the same way described for shallow concrete foundations. Except that the foundation itself will be constructed using galvanized common steel member shapes and/or plates sized and arranged to provide the necessary capacity. Steel shapes will provide attachment of the tower to the foundation. When a plate is used, poorly graded sand will be placed under the plate to provide an even bearing surface. Similar to the shallow concrete foundation, the grillage foundation will be backfilled using native soils compacted in small lifts.

Guyed steel lattice structures require a single foundation at the centerline of the structure. The foundation can be a drilled shaft concrete pier, cast in place shallow foundation, driven steel piles with a pile cap, steel screw piles with a pile cap, micropiles with a pile cap or steel grillage. The structural guys will each require an anchor. The anchors can be shallowly buried grillage, plates or a concrete deadman, as well as steel driven, screwed or micro piles with or without a steel cap and grouted rods.

Piles are deep foundation elements manufactured from steel shapes or pipes. The types considered for this project are driven and screw piles. Driven piles are steel H or pipe shapes. They are advanced using a pile driving hammer attached to specialized tracked construction equipment. Screw Piles are manufactured using steel pipe with steel plate helixes welded to the lower section. They are “twisted” into the ground using a high torque head attached to tracked construction equipment. The advantage for both types of piles is that no excavation is required for installation.

Where solid rock is encountered, blasting, rock hauling, or the use of a rock anchoring or micro-pile system may be required. Micro-piles are high capacity, small diameter (5-inch to 12-inch) drilled and grouted in-place piles designed with a steel tendon designed to resist structural loading. The rock anchoring or micro-pile system would be used in areas where site access is limited or adjacent structures could be damaged as a result of blasting or rock-hauling activities.

All pile type foundations will require multiple pile elements be installed at each location. A cap, steel or concrete, will be required to tie the pile elements together structurally and provide the needed capacity.

In environmentally sensitive areas with very soft soils, additional equipment such as a HydroVac, which uses water pressure and a vacuum, may be used to excavate material into a storage tank. Alternatively, a temporary casing may be used during drilling to hold the excavation open. Depending on the foundation and soil types, the casing may be withdrawn as the concrete or grout is placed in the hole. In areas where it is not possible to operate large drilling equipment due to access or environmental constraints, hand digging may be required.

Reinforced-steel anchor bolt cages would be installed after excavation and prior to structure installation. These cages are designed to strengthen the structural integrity of the foundations and would be assembled at the nearest Yard and delivered to the structure site via flatbed truck or helicopter. These cages would be inserted in the holes prior to placing concrete. The excavated holes containing the reinforcing anchor bolt cages would be filled with concrete.

Typically, and because of the remote location of much of the transmission line route, concrete would be provided from portable batch plants set up approximately every 60 miles along the line route in one of the multi-purpose yards. Concrete would be delivered directly to the site in concrete trucks with a capacity of up to 10 cubic yards. In the more developed areas along the route and in proximity to the substations, the construction contractor may use local concrete providers to deliver concrete to the site when economically feasible.

3.2.6 Erect Support Structures

The 500-kV self-supporting lattice-steel and H-frame structures would be assembled on site, except where helicopter delivery is employed. Steel members for each structure would be delivered to the site by flatbed truck. Assembly would be facilitated on site by a truck-mounted crane. Subsequent to assembly, the structures would be lifted onto foundations using a large crane designed for erecting structures. The crane would move along the right-of-way from structure site to structure site erecting the structures.

The 500kV guyed steel lattice structures would be assembled either directly on site or in a designated assembly facility near the line. Steel members for each structure would be delivered in packaged bundles to the structure site or to the assembly facility by flatbed truck. Assembly at the final installation site of each tower is the most common method used in transmission line construction. When assembled at the structure site, large components of the tower such as legs, main body, or head frame will be independently assembled on blocks with the use of a small crane. Site assembly will require several days with a crew of four to six workers. These tower sections will be located on the site convenient for erection by a larger crane.

Remote assembly may be performed in order to maximize efficiency. Tower sections can be assembled into easily transportable modules that can be taken to the tower site by flatbed truck or by helicopter. Modular assembly will allow crews to become proficient in assembly of the various tower elements, and to do it all in fewer sites. Material delivery can be streamlined by shipping raw tower materials to fewer locations. This assembly yard will be much larger than tower pads to accommodate approximately twenty towers at a time.

Subsequent to assembly, the structures would be lifted onto foundations using a large crane designed for erecting structures. The crane would move along the right-of-way from structure site to structure site erecting the structures.

Each tower site will require a temporary work pad of up to 250 feet by 250 feet (same as self-supporting towers) to accommodate assembly of tower components and to allow adequate space for a crane to lift the tower in to place. This required work pad area may be smaller if helicopter erection is used and if the tower is assembled in a remote yard.

When a separate facility is used for tower assembly, tower components will be assembled into modules that can be hauled to the site either by truck or by helicopter. Those modules to be hauled by truck will have limits in width and length. Those to be flown by helicopter will be limited based on weight and the lifting capability of the helicopter. Efficiency in helicopter construction requires limiting the number of lifts per tower, and having many tower modules ready for erection at one time. A large staging area strategically located near the line will facilitate the erection process.

Whether by land crane or by helicopter, the assembled tower will be lifted and placed on the center bearing foundation. While being held vertically in place, guy wires will be connected to pre-installed anchors at the four corners and adjusted to plumb and secure the tower.

The 345kV H-frame, single-circuit and double-circuit mono-pole structures would be framed on site. Two methods of assembly can be used to accomplish this, the first of which is to assemble the poles, braces, cross arms, hardware, and insulators on the ground. A crane is then used to set the fully framed structure by placing the poles in the excavated holes. Alternatively, aerial framing can be used by setting the poles in the ground first and assembling the braces, cross arms, hardware, and insulators in the air. A crane would move along the right-of-way from structure site to structure site setting the structures.

3.2.7 String Conductors, Shield Wire, and Fiber Optic Ground Wire

Conductor, shield wire, and OPGW would be placed on the transmission-line support structures by a process called stringing. The first step to wire stringing would be to install insulators (if not already installed on the structures during ground assembly) and stringing sheaves. Stringing sheaves are rollers that are attached temporarily to the lower portion of the insulators at each transmission line support structure to allow conductors to be pulled along the line. These sheaves will each have two or three rollers corresponding to the number of conductors designated as a “bundle” at each phase location. All conductors of one phase will be pulled in together. Figure 13 illustrates the setup in installing conductors.

Additionally, temporary clearance structures (also called guard structures) would be erected where required prior to stringing any transmission lines. The temporary clearance structures typically are vertical wood poles with cross arms and are erected at road crossings or crossings with other energized electric and communication lines to prevent the wires being pulled in from accidental contact with other lines, vehicles, buildings or the ground during stringing activities. Bucket trucks also may be used to provide temporary clearance. Bucket trucks are trucks fitted with a hinged arm ending in an enclosed platform called a bucket, which can be raised to let the worker in the bucket service portions of the transmission structure as well as the insulators and conductors without climbing the structure.

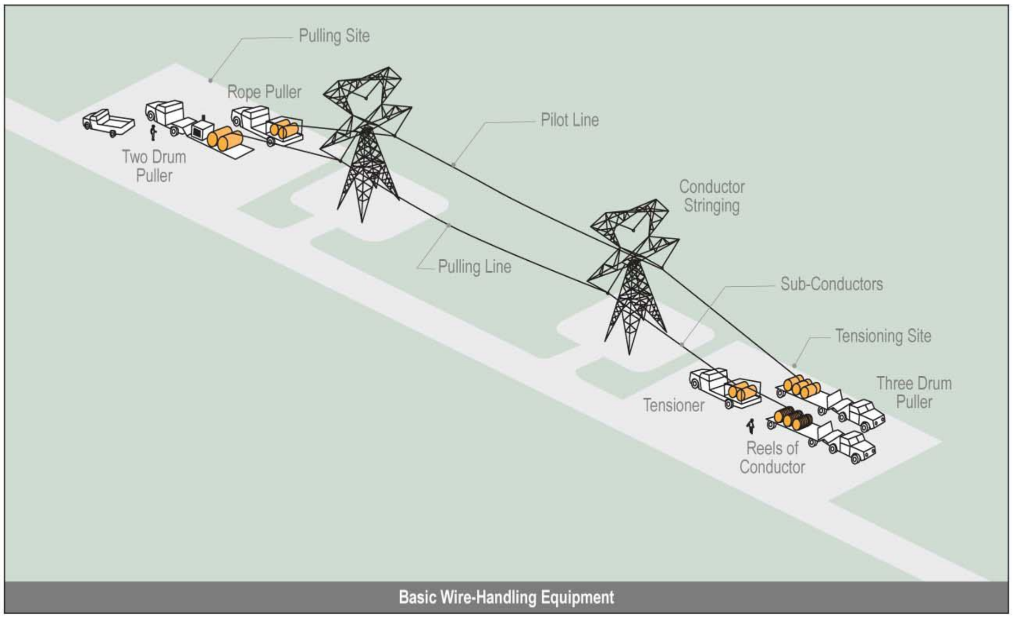


Figure 13 Conductor Installation

Once the stringing sheaves and temporary clearance structures are in place, the initial stringing operation would commence with the pulling of a lighter weight “sock line” through the sheaves along the same path the transmission line would follow. Typically, the sock line is pulled in via helicopter. The sock line is attached to the hard line, which follows the sock line as it is pulled through the sheaves. The hard line would be attached to the conductor, shield wire, or OPGW to pull them through the sheaves into their final location. Pulling the lines may be accomplished by attaching them to the large bull wheels a specialized wire stringing vehicle. Following the initial stringing operation, pulling and tensioning the line would be required to achieve the correct sagging of the transmission lines between support structures.

Line splicing sites for 500kV construction would be required approximately every conductor length on a standard size reel (approximately 9,000 feet) along the right-of-way and would measure approximately 100 by 100 feet with two wire pulling-and-tensioning sites occurring approximately every 3 to 5 miles measuring 250 by 400 feet each to accommodate required equipment. A pulling–and-tensioning site would be needed for each of the for 345kV segments requiring approximately 150 by 400 feet each to accommodate required equipment. Equipment at sites required for pulling-and-tensioning activities would include cranes, tractors, and trailers with spooled reels that hold the conductors and trucks and trailers with the pulling-and-tensioning equipment mounted. To the extent practicable, pulling and tensioning sites would be located within the right-of-way. Depending on topography, grading may be required at some sites to create level pads for equipment. Finally, the tension and sag of conductors and wires would be fine-tuned, stringing sheaves would be removed, and the conductors would be attached permanently to the insulators at the support structures.

At the tangent (in-line) and small angle structures, the conductors would be attached to the insulators using clamps to “suspend” the conductors from the bottom of the insulators. At the larger angle dead-end structures, the conductors cannot be pulled through and so are cut and attached to the insulator assemblies at the structure “dead ending” the conductors. There are two primary methods to attach the conductor to the insulator assembly at the dead-end structure. The first method, hydraulic compression fittings, uses a large press and pump that closes a metal clamp or sleeve onto the conductor. This method requires heavy equipment and is time consuming. The second method, implosive fittings, uses explosives to compress the metal together. Implosive fittings do not require heavy equipment, but do create noise similar to a loud explosion when the primer is struck. The implosive type sleeve is faster to install and results in a secure connection between the conductor and the sleeve. Both implosive and conventional compression sleeves are planned for the Project.

The 500kV single-circuit lines use a three conductor bundle for each phase. At each single-circuit 500kV dead-end structure, nine compression or implosive dead-end bodies along with nine compression or implosive terminal connectors to connect the jumpers (three per phase, one for each of the three subconductors on each of the three phases) on each side of the structure would be required, for a total of 18 dead-end bodies and terminal connectors for each single-circuit dead-end structure. The 345kV single-circuit lines use a two-conductor bundle for each phase. Each 345kV dead-end structure would require 12 compression or implosive dead-end bodies along with 12 compression or implosive terminal connectors to connect the jumpers.

3.2.8 Site Reclamation

Multi-purpose yards, helicopter fly yards, and any other locations used for the purpose of the Project, as well as access roads would be kept in an orderly condition throughout the construction period. Approved enclosed refuse containers would be used throughout the Project. Refuse and trash would be removed from the sites and disposed of in an approved manner. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. Open burning of construction trash would not be allowed.

Disturbed areas not required for access roads and maintenance areas around structures would be restored and revegetated, as required by the landowner or land-management agency as soon as possible to limit the spread and establishment of noxious weed species. Multi-purpose yards, helicopter fly yards, structure work areas, wire pulling-and-tensioning sites, wire-splicing sites, guard structures, and temporary roads would be decompacted and the topsoil replaced unless otherwise specified by the landowner or land-management agency. The landowner, land-management agency, or local Natural Resources Conservation Service would be consulted regarding the appropriate seed mix and rate to revegetate the areas. Temporary culverts would be removed. Drivable at-grade waterbars would be installed where needed with frequency proportional to road slope to prevent erosion of the roadbed. All practical means would be made to restore the land outside the minimum areas needed for safe operation to its original contour and to restore natural drainage patterns along the right-of-way.

The seed mix used for any restoration and revegetation project would be determined in consultation with the landowner or land-management agency. All seed and plant material used on federal land would be approved by the federal land-management agency. All seed would meet all of the requirements of the Federal Seed Act and applicable Wyoming, Colorado, and Utah laws regarding seeds and noxious weeds. Only seed certified as “noxious weed free” would be used. If requested, the Company or its contractor would provide the landowner with evidence of seed certification. Any seed mixture would not contain aggressive, non-native species that might invade the site. Where necessary, the surface of the ground would be prepared prior to seeding. Where practical, the Company would follow these guidelines for preparing the seedbed:

1. The road surface would be cleared of foreign materials, such as garbage, paper, and other materials, but all rocks, limbs, or minor woody debris would be left in place. The Company or its contractor would prepare the seedbed immediately prior to seeding.

2. Under favorable soil-moisture conditions, a standard disk or spring bar harrow would be used (where ripping is not required) to roughen the topsoil layer to create the desired surface texture before the seed is applied. Dirt clods and chiseled voids resulting from the roughening process increase the surface area for water collection and provide micro-sites for seed establishment. The soil should be disked or harrowed to no more than 2 inches deep at a time when soil moisture allows the surface to remain rough, with clods approximately 2 to 4 inches in diameter.

3. Ripping, disking, or harrowing would be performed parallel to surface contours. In this way, downslope alignment of furrows can be avoided. In areas that already have the desired soil characteristics; the seedbed does not need to be prepared.

After the seedbed has been prepared, the Company or its contractor would broadcast the seed on the disturbed area, after which the seed would be lightly harrowed into the roadbed or raked into the ground. Mulch and fertilizers would be added if necessary. An area would not be seeded when wind velocities prohibit the seed mix from being applied evenly. If the seed does not germinate and establish to an agreed-upon level of vegetation cover (e.g., consistent with adjacent site conditions) after two growing seasons, the Company or its contractor would reseed during a period acceptable to the landowner. On National Forest System land, the Company would be responsible for monitoring the effectiveness of soil protection and restoration measures and would take corrective measures as needed to ensure long-term soil protection.

Other seeding methods, such as drilling, hydroseeding, or aerial application, may be used depending on the area that requires reclamation and site conditions.

3.3 Communications System

OPGW for the communications system would be installed at the same time as the conductors on each of the transmission line structures. It would be tensioned in the same way.

3.3.1 Regeneration Stations

Similar to the substations, the selected area is graded, vegetation is removed, and a layer of crushed rock is installed. Typically, a 12-foot by 32-foot by 9-foot-tall building or equipment shelter (metal or concrete) would be constructed on the site. An emergency generator with a liquid-petroleum-gas-fuel tank would be installed, in accordance with current regulations, at the site inside the fenced area. Two diverse communication cable routes (aerial and/or buried) from the transmission right-of-way to the equipment shelter would be installed.

3.3.2 Access Road

Regeneration station roads would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or off site.

Either gravel or asphalt would be applied to the prepared base layer. The all-weather road surface would be graveled and would have crossroad drainage where applicable.

3.4 Substation/Series Compensation Substation Construction

As mentioned in Section 1.2 of this appendix, construction activities at the Aeolus, Clover, and Mona substations, including expansions and areas needed for equipment installation for Gateway South will be or have been completed as components of other projects of the Energy Gateway program. The two series compensation substations would be constructed as part of the Gateway South Project. A description of typical substation construction follows.

A typical construction sequence for substations and series compensation sites is described below. All equipment and materials would be hauled to the site via truck.

The first activity is grading of the site and access road. The amount of equipment and manpower would vary depending on the size of the site and the terrain. However, large earth moving equipment would be used including dump trucks, water trucks, graders, back hoes and dozers. Dump trucks would be used to haul away unsuitable materials and to bring in fill materials if necessary and access road surfacing.

The earth moving equipment would be used to grade the site relatively flat with a small slope for drainage, and depending on site design, drainage features and/or retention ponds. The water trucks would be used to control dust from site work activities.

The perimeter fence would then be constructed to provide site security and control access.

Foundations would then be installed. There are typically two types of foundations: drilled piers and slabs. Foundations are excavated using a large drill rig or backhoe depending on the type of foundation. Reinforcing steel and/or anchor bolts are placed in the excavation and forms are placed to form the sides of the top portion of the foundation. The entire excavation is then filled with concrete. The spoils from the excavations are hauled from the site and disposed of, or spread on the site if the material is suitable. On a large site, multiple crews would be used.

The control building would be constructed at the same time as the foundation construction. The building would be constructed of masonry block or would be pre-engineered steel construction depending on design.

The remaining below-grade construction is then completed, including grounding conductors and ground rods, conduit, and concrete cable trench. Excavations are made with trenchers and backhoes, the conductor or conduit is placed in the excavation, connections are made, and then backfilled. In some cases, bedding material, such as sand, is placed in the excavation prior to back filling.

Equipment and steel structures are set on the completed foundations and connected. Equipment includes circuit breakers; disconnect switches, transformers, reactors, capacitors, series capacitors, surge arresters, and instrument transformers. Rigid tubular bus is used for the main conductors, with flexible cable connections to the equipment. All high-voltage conductors are supported on insulators. Construction equipment includes cranes and man lifts. On a large site, multiple crews would be used.

Control and protection panels would be installed in the control building and would be connected to equipment in the yard using control and power cables installed in the cable trenches and conduits.

The final step is to cover the entire site with a crushed rock surfacing. Dump trucks would be used to haul the material to the site. Back hoes, skid steers, dozers and graders would be used to spread and compact the material over the site.

All equipment, protection and control systems would be tested prior to energizing.

3.4.1 Substation Roads

Substation roads would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or off-site. Either gravel or asphalt would be applied to the prepared base layer and would have crossroad drainage where applicable.

3.4.2 Geotechnical Drilling

Although the expansions and areas needed for Gateway South equipment installation were analyzed as part of other Energy Gateway program projects, geotechnical evaluation is required at both substation sites, as well as the two series compensation substation sites, to quantify subsurface conditions, determine engineering properties of soil for foundation design and provide recommendations for site development.

The substation geotechnical exploration program would consist of drilling approximately 25 to 30 borings at each substation and each series compensation station. Borings would be advanced to an approximate depth of 50 feet (depending on the depth of anticipated cuts, fills, and structure foundations) using hollow-stem auger, air-rotary, and/or ODEX drilling methods. If competent bedrock is encountered, coring would be advanced 5 to 15 feet into competent rock. Refraction microtremor and field resistivity testing would be completed at each of the two substation sites and the two series compensation station sites. Field resistivity measurements would be conducted in general accordance with the Wenner 4-pin method.

3.4.3 Clearing and Grading

Clearing of all vegetation would be required for the entire series compensation substation area, including a distance of about 10 feet outside the fence. This is required for personnel safety due to grounding concerns and because of lower clearances to energized conductors within the substations as compared to transmission lines. These lower clearances are allowed by the NESC because the entire substation is fenced.

An insulating layer of gravel on the surface of the substation is required to protect personnel from high currents and voltages during electrical fault conditions. Typically, vegetation is removed and a 4- to 6-inch layer of crushed rock is applied to the finished surface of the substation. Then the substation is usually treated with a soil sterilizer to prevent vegetation growth because the vegetation would degrade the insulating qualities of the crushed rock. The entire substation area would be graded essentially flat, with just enough slope to provide for runoff of precipitation. The substation would be graded to use existing drainage patterns to the extent possible. In some cases, drainage structures, such as ditches, culverts, and sumps, may be required. Clearing and grading material would be disposed of in compliance with local ordinances. Material from off site would be obtained at existing borrow or commercial sites and would be trucked to the substation using existing roads and the substation access road.

3.4.4 Multi-purpose Yards

Multi-purpose yards may be located outside the substation fenced area near the substation site. These yards may be part of the substation property or leased by the contractor. After construction is completed, all debris and unused materials would be removed and the yards returned to preconstruction conditions by the construction contractor.

3.4.5 Grounding

A grounding system is required in each substation for detection of faults and for personnel safety. The grounding system typically consists of buried copper conductor arranged in a grid system and driven ground rods, typically 8 to 10 feet long. The ground rods and any equipment and structures are connected to the grounding conductor grid. The amount of conductor and length and number of ground rods required are calculated based on fault current and soil characteristics.

3.4.6 Fencing

Security fencing is installed around the entire perimeter of each new or expanded substation to protect sensitive equipment and prevent accidental contact with energized conductors by third parties. This 7-foot-high fence would be constructed of chain link with steel posts. One foot of barbed wire or other similar material is installed on top of the chain link yielding a total fence height of 8 feet. Locked gates would be installed at appropriate locations for authorized vehicle and personnel access.

3.4.7 Foundation Installation

Foundations for supporting structures are of two types: spread footings or drilled piers. Spread footings are placed by excavating the foundation area, placing forms and reinforced-steel and anchor bolts, and pouring concrete into the forms. After the foundation has been poured, the forms would be removed, and the surface of the foundation dressed. Pier foundations are placed in a hole generally made by a truck-mounted auger. Reinforced-steel and anchor bolts are placed into the hole using a truck-mounted crane. The portion of the foundation above ground would be formed. The portion below ground uses the undisturbed earth of the augered hole as the form. After the foundation has been poured, the forms would be removed, the excavation would be backfilled, and the surface of the foundation dressed.

Equipment foundations for circuit breakers and transformers would be slab-on-grade type. These foundations are placed by excavating the foundation area; placing forms, reinforced steel, and anchor bolts (if required); and placing concrete into the forms. After the foundations have been poured, the forms would be removed, and the surface of the foundation dressed. Where necessary, provision would be made in the design of the foundations to mitigate potential problems due to frost. Reinforced steel and anchor bolts would be transported to each site by truck, either as a prefabricated cage or loose pieces, which would be fabricated into cages on the site. Concrete would be hauled to the site in concrete trucks. Excavated material would be spread at the site or disposed of in accordance with local ordinances. Structures and equipment would be attached to the foundations by means of threaded anchor bolts embedded in the concrete. Some equipment such as transformers and reactors may not require anchor bolts.

3.4.8 Oil Containment

Some types of electrical equipment, such as transformers and some types of reactors and circuit breakers, are filled with an insulating mineral oil. Containment structures are required to prevent equipment oil from getting into the ground or water bodies in the event of a rupture or leak. These structures take many forms depending on site requirements, environmental conditions, and regulatory restrictions. The simplest type of oil containment is a pit, of a calculated capacity, under the oil-filled equipment that has an oil-impervious liner. The pit is filled with rock to grade level. In case of an oil leak or rupture, the oil captured in the containment pit is pumped into tanks or barrels and transported to a disposal facility. If required, more elaborate oil containment systems can be installed. This may take the form of an on- or off-site storage tank and/or oil-water separator equipment depending on site requirements.

3.4.9 Structure, Control Building, and Equipment Installation

Supporting steel structures are erected on concrete foundations as noted above. These are set with a truck-mounted crane and attached to the foundation anchor bolts by means of a steel base plate. These structures would be used to support the energized conductors and certain types of equipment. This equipment is lifted onto the structure by means of a truck-mounted crane and bolted to the structures; electrical connections are then made. Some equipment, such as transformers, reactors, and circuit breakers, are mounted directly to the foundations without supporting structures. These are set in place by means of a truck-mounted crane. Some of this equipment requires assembly and testing on the pad. Electrical connections to the equipment are then made.

3.4.10 Control Building Construction

One or more control buildings are required at each substation to house protective relays, control devices, battery banks for primary control power, and remote monitoring equipment. The size and construction of the building depends on individual substation requirements. Typically, the control building would be constructed of concrete block, pre-engineered metal sheathed, or composite surface materials. Once the control house is erected, equipment is mounted and wired inside. All stand-alone regeneration stations and substations (with the exception of the Aeolus Substation) would require an emergency propane or diesel generator just outside the control house within the substation fenced area.

3.4.11 Conductor Installation

The two main types of high-voltage conductors used in substations are tubular aluminum for rigid bus sections and/or stranded-aluminum conductor for strain bus and connections to equipment. Rigid bus would be a minimum of 4 inches in diameter for this Project and would be supported on porcelain or polymer insulators on steel supports. The bus sections would be welded together and attached to special fittings for connection to equipment. Stranded-aluminum conductors would be used as flexible connectors between the rigid bus and the station equipment.

3.4.12 Conduit and Control Cable Installation

Most substation equipment requires low-voltage connections to protect relaying and control circuits. These circuits allow metering, protective functions, and control (both remote and local) of the power system. Connections are made from the control building to the equipment through multi-conductor control cables installed in conduits and/or pre-cast concrete cable trench system.

3.4.13 Construction Cleanup

The cleanup operation would be performed after construction activities are completed. All waste and scrap material would be removed from the site and deposited in approved locations or local permitted landfills in accordance with local ordinances. Ruts and holes outside the substation fence due to construction activities would be regraded.

3.4.14 Reclamation

Revegetation and restoration would be conducted as required and desired vegetation established to limit the spread and establishment of noxious weed species in disturbed areas.

3.5 Special Construction Techniques

3.5.1 Blasting

Typical 500kV steel-lattice structure foundations and the 345kV mono-pole structure foundations normally would be installed using drilled shafts or piers and 345kV H-frame structures would be embedded directly. If hard rock is encountered within the planned drilling depth, blasting may be required to loosen or fracture the rock in order to reach the required depth to install the structure foundations. Precise locations where blasting is expected would be identified based on a site-specific geotechnical study carried out as part of detailed design. A blasting plan would be developed and approved by the agencies as part of the Construction POD.

3.5.2 Helicopter Use

Helicopters may be used to construct in rough terrain where access is difficult or where access through environmentally sensitive areas cannot be avoided. A small helicopter may be used to move personnel and to install pulling lines (called “sock-lines”) in order to facilitate installing conductor. Larger, heavy-lift helicopters could be used to ferry construction equipment, concrete, or structures to a specific site.

Project construction activities potentially facilitated by helicopters may include delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire-stringing operations. Helicopters also may be used to support the administration and management of the Project by the construction contractor or Company.

Helicopters would set down in areas identified to receive temporary disturbance. The operating area of the helicopters would be limited to helicopter fly yards and multi-purpose yards and positions along the utility corridors that previously have been identified for this purpose, and are safe locations for landing. When a portion of the transmission line requires construction using helicopter support, the multi-purpose yards would serve as a helicopter support yard for fueling, maintenance, and transporting both material and personnel to and from the structure site locations.

Final siting requirements of all helicopter fly yards and support yards and site requirements would be conducted with the input of the helicopter contractor, and affected private landowners and land-management agencies, such as the Bureau of Land Management (BLM) and U.S. Forest Service (USFS). The size of each helicopter fly yard and support yard would be dependent on the size and number of structures to be installed within safe flying range.

The area required for these fly yards can range in size and depends on road access and topography. The yards should be as level as possible, and be located strategically throughout the area of helicopter-supported construction activity. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and/or graded, including removal of trees in some instances. Ideally they should be located at a higher elevation than the structure sites they would support, as it is safer and more fuel efficient to fly down toward the structure site with heavy loads than it is to fly up to the structure site. Additionally, the fly yards must be accessible by road to facilitate the delivery of structure steel, rebar, concrete, construction tools, equipment, and other materials used in the construction of the structures.

The following are activities that may take place at helicopter fly yards:

- Structure steel, bolts, fittings, and blocking would be hauled and stored for use.

- Structure sections would be preassembled using a rough terrain crane.
- Rebar for assembling cages and/or preassembled rebar cages for structure foundations would be delivered, then flown out of this yard to each structure site.
- Concrete would be staged by truck delivery or batch plant, which would generate the required concrete to be loaded into a concrete transport bucket that would be attached to a helicopter and flown out to the structure sites.
- Refueling the helicopter and necessary light maintenance; a fuel truck and a mechanics truck would be located at these yards.
- Transporting personnel, tools, and small equipment by helicopter to and from the yards and the construction sites.
- Temporary parking for a fuel truck, a mechanics truck, and transport vehicles for personnel.
- Yards may serve as a safe landing area for the helicopter in case of an emergency.

The specific types of helicopters used would be based upon the Project need, the weight of the load being transported, and the altitude of the structure location. The various needs would range from light loads (crew/inspector transportation, and conductor stringing) to medium-to-heavy loads (tool and material delivery/removal, and structure removal/construction activities). The specific helicopters used also would vary, depending on availability and Project schedule.

Construction workers and equipment would be dropped off at pulling-and-tensioning sites, structure locations, or other work areas to receive temporary disturbance.

Large heavy-lift helicopters would be used to transport a structure to a location where the ground crew is waiting to spot the structure onto a preconstructed foundation. The helicopter would fly from predetermined yards and transport the preassembled structure sections to each structure site. Depending on the size and weight of the load, several round trips may be required from the helicopter fly yard to fully construct each structure. Each fly yard can support several structure sites and must be located no farther away from the structure-site locations than is within the safe round-trip-flight distance limitation of the helicopter(s) being used. The typical safe round trip flight distance for a heavy-lift helicopter is a 2- to 3-mile radius, depending upon altitude and load.

During helicopter operations, public access to defined areas would be restricted. Temporary road closures, traffic detours, and posted notices and signs would be used to restrict public access to construction areas. This would be in addition to general public access restrictions to protect public health and safety.

3.5.3 Water Use

Construction of the transmission lines and series compensation substations would require water. Major water uses are for transmission line structure and station foundations, and dust control during right-of-way and substation grading and site work. A minor use of water during construction would include the establishment of substation landscaping where required. Table 4 (based on the route of approximately 400 miles) lists the approximate amount of water required for the Project.

Table 4
Estimated Water Usage

Transmission Line Spread	**Total Million Gallons**
Spread 1	59
Spread 2	27
Spread 3	21
Total Transmission Line Water Usage	107
Series Compensation Substations	**Total Million Gallons**
Series Compensation Substation 1	7
Series Compensation Substation 2	10
Total Series Compensation Substations	17
Total Million Gallons Water Required	**124**

Water would be used for two primary purposes: foundation construction and right-of-way and access-road dust control. The required water would be procured from municipal sources, from commercial sources, or under a temporary water-use agreement with landowners holding existing water rights. No new water rights would be required. In the construction of foundations, water is transported to the batch-plant site where it would be used to produce concrete. From the batch plant, the wet concrete would be transported to the structure site in concrete trucks for use in foundation installation.

Construction of the transmission lines and related facilities would generate a temporary increase in fugitive dust. If the level of fugitive dust is too high in specific Project areas, as determined in cooperation with the landowner or land-management agency, water would be applied to disturbed areas to minimize dust.

Water usage for substation construction is primarily for dust control during site preparation work. During this period, construction equipment would be cutting, moving, and compacting the subgrade surface. As a result, water trucks patrolling the site to control dust would make as many as one pass per hour over the station site. Once site preparation work is complete, concrete for the placement of foundations becomes the largest user of water and dust control becomes minimal.

Generally, water use will be less when using guyed structures due to there being less volume of concrete used. Additionally, water use for foundations regardless of structure type pales in comparison to that used for dust control. Water estimates will be provided when structure spotting is complete.

Once site grading is complete, the balance of the substation construction work would be performed on bare subgrade soil or subgrade with a thin layer of rock. Fire risk would be minimal due to the bare ground or rock surface, and would be contained within the confines of station fenced area.

3.6 Construction Elements

3.6.1 Construction Workforce

The proposed Project would be constructed primarily by contract personnel, with the Company responsible for Project administration and inspection. The construction workforce for the transmission line would consist of laborers, craftsmen, supervisory personnel, support personnel, and construction management personnel who would perform the construction tasks see Table 5 for work force estimates.

Site grading requires a small number of people including a surveyor, heavy equipment operators, foreman, and construction-management personnel. Each series compensation station would require numerous concrete crews in order to complete the below grade construction and concrete placement on schedule. Concrete most likely would be provided by a batch plant producing approximately 160 cubic yards per day delivered in 8-cubic-yard trucks. Other below-grade crews would be needed to install conduit, cable trench, and ground mat material. The below-grade crews would be on site overlapping the schedule of the concrete crew. Several three-man crews working with boom trucks and bucket trucks would erect the steel and install the physical equipment in the yard (Table 6 – Manpower and Equipment for Series Compensation Stations). Electrical installation would be handled by several two-man teams alternating between indoor and outdoor activity. Construction generally would occur between 7 a.m. and 7 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies or to complete critical construction activities.

3.6.2 Construction Equipment and Traffic

Equipment required for construction of Gateway South would include, but would not be limited to, that listed in Table 7 – Typical Equipment and Duration of Use. This table includes the equipment type and the anticipated daily duration of use for each equipment type.

Estimated Personnel and Equipment for 500kV Transmission Line Construction access would occur at several locations along the transmission line route, resulting in dispersed construction traffic. Truck deliveries normally would be on weekdays between 7:00 a.m. and 5:00 p.m.

3.6.3 Construction Equipment and Traffic

Equipment required for construction of Gateway South would include, but would not be limited to, that listed in Table 7 – Typical Equipment and Duration of Use. This table includes the equipment type and the anticipated daily duration of use for each equipment type.

Estimated Personnel and Equipment for 500kV Transmission Line Construction access would occur at several locations along the transmission line route, resulting in dispersed construction traffic. Truck deliveries normally would be on weekdays between 7:00 a.m. and 5:00 p.m.

The equipment required for transmission line construction is similar for both the 500kV and 345kV lines. The highest level of traffic would be when the wire-stringing operations begin while several other operations are occurring at the same time, which would likely include excavating holes, installing foundations, hauling steel, assembling structures, and erecting structures.

Table 5
Work Force Estimation – Duration and Totals for Construction of a 500-kilovolt Transmission Line

Work Item	Estimated Duration (Weeks)			Number of Crews			Number of Workers per Crew			Total Number of Workers		
	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3
Construction management/ supervision – contractor	121	91	107	1	1	1	10	10	10	10	10	10
Construction maintenance and repairs	121	91	107	1	1	1	8	8	8	8	8	8
Construction management – owner	121	91	107	1	1	1	5	5	5	5	5	5
Inspection	121	91	107	1	1	1	12	12	12	12	12	12
Contractor mobilization	16	16	16	3	3	3	3	3	3	9	9	9
Receive and handle materials	114	82	98	2	2	2	4	4	4	8	8	8
Survey/stake access roads and structure pads	85	47	44	2	2	2	3	3	3	6	6	6
Construct access roads and structure pads	85	47	44	1	1	2	9	9	9	9	9	18
Survey/stake new structure locations	85	47	44	1	1	1	3	3	3	3	3	3
Tree removal/clearing	0	21	32	0	2	2	0	9	9	0	18	18
Excavate structure holes	84	42	33	2	2	2	2	2	2	4	4	4
Tie and haul rebar	84	42	33	1	1	1	5	5	5	5	5	5
Set forms and pour concrete	84	42	33	1	1	1	13	13	13	13	13	13
Batch plant(s) and concrete trucks	84	42	33	1	1	1	13	13	13	13	13	13
Haul steel and materials	84	42	33	1	1	1	3	3	3	3	3	3
Haul blocking and shake-out steel	84	42	33	1	1	1	4	4	4	4	4	4
Assemble structures – tangent	84	42	33	6	6	6	9	9	9	54	54	54
Assemble structures – dead-end	84	42	33	2	2	2	12	12	12	24	24	24
Bottom setting crews (legs and body ext.)	84	42	33	1	1	1	8	8	8	8	8	8
Structure torqueing crew	84	42	33	1	1	1	5	5	5	5	5	5
Erect structures	72	37	28	2	2	2	10	10	10	20	20	20
Backbolt and torque after erection	72	37	28	2	2	2	3	3	3	6	6	6
Load, haul, and spot overhead optical ground wires, overhead optical ground wire, and conductors	68	35	33	1	1	1	5	5	5	5	5	5

Table 5
Work Force Estimation – Duration and Totals for Construction of a 500-kilovolt Transmission Line

Work Item	Estimated Duration (Weeks)			Number of Crews			Number of Workers per Crew			Total Number of Workers		
	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3	Spread 1	Spread 2	Spread 3
Install and remove guard structures	68	35	33	1	1	1	5	5	5	5	5	5
Install overhead optical ground wire, overhead optical ground wire, and conductors	68	35	33	1	1	1	12	12	12	12	12	12
Sage, dead-end, clip, dampers, spacers	68	35	33	6	6	6	6	6	6	36	36	36
Final clean up (gig sheet)	63	33	33	1	1	1	4	4	4	4	4	4
Reclamation/restoration	63	33	33	2	2	2	4	4	4	8	8	8
									Total per spread	299	317	326
									Total workers	942		

NOTES:
Spread 1 of the Company's preferred route in the Draft EIS, approximately 228 miles consisting of Links W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188
Spread 2 of the Company's preferred route in the Draft EIS, approximately 103 miles consisting of Links U242, U280, U285, U300, U400, U401, U404, U406
Spread 3 of the Company's preferred route in the Draft EIS, approximately 76 miles consisting of Links U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640

Table 6
Equipment and Manpower
Needed for Series Compensation Stations

Equipment	Quantity
Site Development (90 acres)	
Scraper – Cat 631	4
Dozer – Cat D9 (pushing and ripping)	1
Dozer – Cat D8 (fill Cat)	1
Grader – Cat 16G	2
Roller Compacter – Cat 583	2
Excavator – Cat 330 (slopes and ditching)	1
Water truck	2
Water storage	1
Water self-loader tower	1
Pump (4-inch)	1
Water tanker	2
GPS laser	1
All-terrain vehicle grader	1
Mechanic truck	1
Fuel truck	1
Pickup – 3/4-ton extended cab	2
Pickup – 1-ton crew cab	6
Office trailer	1
Port-a-potty	4
Dumpster	2
Manpower	35 to 40 days
Foundations	
Drill – Texoma 600 (for bus supports – typical)	1
Drill – Watson 3100 (for towers – typical)	1
Boom truck – 33-ton, National 14110	1
Boom truck – 17-ton, JLG1700JBT	1
Excavator – Cat 315	1
Roller compactor – Bomag BW124	1
Plate compactor – Wacker WP1550	2
Rubber-tire backhoe – Cat 326	1
End dump	1
Water truck	1
Mechanic truck	1
Fuel truck	1
GPS laser	1
All-terrain vehicle for grader	1
Pickup – ¾-ton extended cab	2
Pickup – 1-ton crew cab	2
All-terrain vehicle (golf cart look alike)	3
Office trailer	1
Port-a-potty	4
Dumpster	3
Manpower	30 to 40 days

Table 6
Equipment and Manpower
Needed for Series Compensation Stations

Equipment	Quantity
Steel Structures	
Crane – Grove RT600E	1
Boom truck – 33-ton, National 14110	2
Boom truck – 17-ton, JLG1700JBT	1
Manlift	2
Manpower	12 to 40 days
Equipment Install, Insulators and Bus	
Boom truck – 33-ton, National 14110	2
Boom truck – 17-ton, JLG1700JBT	2
Manlift	4
Welder truck	4
Tools and materials – Conex	2
Manpower	20 to 40 days
Control Wiring	
Boom truck – 17-ton, JLG1700JBT	2
Manlift	4
Small puller	3
Reel stand on trailer	2
Flatbed truck – 10-ton	1
Van – ¾-ton	4
Tools and materials – Conex	2
Fiber splicer van	1
Office trailer	1
Port-a-potty	3
Dumpster	3
Manpower	20 to 40 days

Table 7
Typical Equipment and Duration of Use
for Construction of a 500-kilovolt Transmission Line

	Spread 1				Spread 2				Spread 3			
Equipment	**Quantity**	**Hours per Day**	**Days per Week**	**Estimated Duration (weeks)**	**Quantity**	**Hours per Day**	**Days per Week**	**Estimated Duration (weeks)**	**Quantity**	**Hours per Day**	**Days per Week**	**Estimated Duration (weeks)**
Project Management/Inspection												
Truck – pickup	15	6	6	121	15	6	6	91	15	6	6	107
Project Supervision – Contractor												
Truck – pickup	10	8	6	121	10	8	6	91	10	8	6	107
Main121tenance – Contractor												
Truck – pickup	1	6	6	121	1	6	6	91	1	6	6	107
Truck – flatbed (1-ton)	2	6	6	121	2	6	6	91	2	6	6	107
Truck – mechanics (2-ton)	5	8	6	121	5	8	6	91	5	8	6	107
Survey												
Truck – pickup	1	4	6	85	1	4	6	47	1	4	6	44
Truck – flatbed (1-ton)	1	4	6	85	1	4	6	47	1	4	6	44
Multi-purpose Yards												
Truck – pickup	1	4	6	114	1	4	6	92	1	4	6	98
Truck – flatbed (1-ton)	1	2	6	114	1	2	6	92	1	2	6	98
Truck – flatbed (2-ton)	1	2	6	114	1	2	6	92	1	2	6	98
Forklift (5-ton)	1	8	6	114	1	8	6	92	1	8	6	98
Forklift (10-ton)	1	8	6	114	1	8	6	92	1	8	6	98
Crane RT (20-ton)	1	2	6	114	1	2	6	92	1	2	6	98
Trailer – office	1	10	6	114	1	10	6	92	1	10	6	98
Generator – portable (office)	1	10	6	114	1	10	6	92	1	10	6	98
Tree Clearing												
Truck – pickup	Not applicable				2	8	6	21	2	8	6	32
Truck – flatbed (1-ton)					2	4	6	21	2	4	6	32
Truck – flatbed (2-ton)					1	4	6	21	1	4	6	32
Truck – semi-trailer					4	8	6	21	4	8	6	32
Trailer – timber haul, with pup					4	8	6	21	4	8	6	32
Loader – with grapple					2	6	6	21	2	6	6	32
Loader – bucket					2	6	6	21	2	6	6	32
Slasher					2	6	6	21	2	6	6	32
Chain saws					6	8	6	21	6	8	6	32
Road Building												
Truck – pickup	1	2	6	85	1	2	6	47	2	2	6	44
Truck – flatbed (1-ton)	1	2	6	85	1	2	6	47	2	2	6	44
Truck – flatbed (2-ton)	1	4	6	85	1	4	6	47	2	4	6	44
Truck – water	1	6	6	85	1	6	6	47	1	6	6	44

Table 7
Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line

	Spread 1				Spread 2				Spread 3			
Equipment	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Truck – fuel	1	4	6	85	1	4	6	47	1	4	6	44
Truck – dump (10Y)	2	6	6	85	2	6	6	47	4	6	6	44
Truck – semi-trailer	2	6	6	85	2	6	6	47	4	6	6	44
Trailer – lowboy	2	6	6	85	2	6	6	47	4	6	6	44
Backhoe – with bucket	1	6	6	85	1	6	6	47	2	6	6	44
Loader – with bucket	2	6	6	85	2	6	6	47	4	6	6	44
Loader – with brusher/grubber	2	8	6	85	2	8	6	47	2	8	6	44
Grader – road	1	8	6	85	1	8	6	47	2	8	6	44
Dozer – with blade	2	8	6	85	2	8	6	47	4	8	6	44
Dozer – with ripper	1	8	6	85	1	8	6	47	1	8	6	44
Foundations												
Truck – pickup	3	8	6	84	3	8	6	42	3	8	6	33
Truck – flatbed (1-ton)	6	4	6	84	6	4	6	42	6	4	6	33
Truck – flatbed (2-ton)	2	5	6	84	2	5	6	42	2	5	6	33
Truck – water	1	6	6	84	1	6	6	42	1	6	6	33
Truck – fuel	1	4	6	84	1	4	6	42	1	4	6	33
Truck – dump (10Y)	2	6	6	84	2	6	6	42	2	6	6	33
Truck – semi-trailer	2	8	6	84	2	8	6	42	2	8	6	33
Trailer – lowboy	1	6	6	84	1	6	6	42	1	6	6	33
Trailer – flatbed	2	6	6	84	2	6	6	42	2	6	6	33
Truck – flatbed with boom (5-ton)	1	6	6	84	1	6	6	42	1	6	6	33
Truck – concrete	4	6	6	84	4	6	6	42	4	6	6	33
Drill rig – digger	2	8	6	84	2	8	6	42	2	8	6	33
Drill rig – pneumatic wagon	1	6	6	84	1	6	6	42	1	6	6	33
Backhoe – with bucket	1	4	6	84	1	4	6	42	1	4	6	33
Dozer – with blade	1	4	6	84	1	4	6	42	1	4	6	33
Loader – with bucket	1	4	6	84	1	4	6	42	1	4	6	33
Crane RT (20-ton)	1	4	6	84	1	4	6	42	1	4	6	33
Forklift (5-ton)	1	4	6	84	1	4	6	42	1	4	6	33
Loader – bobcat	1	4	6	84	1	4	6	42	1	4	6	33
Generator – portable (5 horsepower)	2	4	6	84	2	4	6	42	2	4	6	33
Trailer – office	1	10	6	84	1	10	6	42	1	10	6	33
Generator – portable (office)	1	10	6	84	1	10	6	42	1	10	6	33

Table 7
Typical Equipment and Duration of Use
for Construction of a 500-kilovolt Transmission Line

Equipment	Spread 1				Spread 2				Spread 3			
	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Material Hauling												
Truck – flatbed (1-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Truck – flatbed (2-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Truck – semi-trailer	1	8	6	114	1	8	6	42	1	8	6	33
Truck – flatbed with boom (5-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Trailer – flatbed	6	8	6	114	6	8	6	42	6	8	6	33
Forklift (10-ton)	1	4	6	114	1	4	6	42	1	4	6	33
Steel Assembly												
Truck – pickup	4	8	6	84	4	8	6	42	4	8	6	33
Truck – flatbed (1-ton)	20	4	6	84	20	4	6	42	20	4	6	33
Truck – flatbed (2-ton)	3	8	6	84	3	8	6	42	3	8	6	33
Truck – water	1	6	6	84	1	6	6	42	1	6	6	33
Crane RT (20-ton)	6	4	6	84	6	4	6	42	6	4	6	33
Compressor – pneumatic	6	6	6	84	6	6	6	42	6	6	6	33
Generator – portable (5 horsepower)	2	2	6	84	2	2	6	42	2	2	6	33
Trailer – office	1	10	6	84	1	10	6	42	1	10	6	33
Generator – portable (office)	1	10	6	84	1	10	6	42	1	10	6	33
Steel Erection – Conventional[1]												
Truck – pickup	3	8	6	72	3	8	6	37	3	8	6	28
Truck – flatbed (1-ton)	6	4	6	72	6	4	6	37	6	4	6	28
Truck – flatbed (2-ton)	2	4	6	72	2	4	6	37	2	4	6	28
Crane RT (20-ton)	2	6	6	72	2	6	6	37	2	6	6	28
Crane RT (75-ton)	2	6	6	72	2	6	6	37	2	6	6	28
Crane (150- to 250-ton)	2	6	6	72	2	6	6	37	2	6	6	28
Dozer – with blade	2	6	6	72	2	6	6	37	2	6	6	28
Compressor - pneumatic	2	4	6	72	2	4	6	37	2	4	6	28
Steel Erection – Helicopter[2]												
Truck – pickup	3	8	6	24	3	8	6	12	3	8	6	12
Truck – flatbed (1-ton)	6	4	6	24	6	4	6	12	6	4	6	12
Truck – flatbed (2-ton)	2	4	6	24	2	4	6	12	2	4	6	12
Crane RT (20-ton)	1	6	6	24	1	6	6	12	1	6	6	12
Crane RT (75-ton)	1	6	6	24	1	6	6	12	1	6	6	12
Crane (150- to 250-ton)	1	6	6	24	1	6	6	12	1	6	6	12

Table 7
Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line

	Spread 1				**Spread 2**				**Spread 3**			
Equipment	**Quantity**	**Hours per Day**	**Days per Week**	**Estimated Duration (weeks)**	**Quantity**	**Hours per Day**	**Days per Week**	**Estimated Duration (weeks)**	**Quantity**	**Hours per Day**	**Days per Week**	**Estimated Duration (weeks)**
Dozer – with blade	2	6	6	24	2	6	6	12	2	6	6	12
Compressor - pneumatic	2	4	6	24	2	4	6	12	2	4	6	12
Truck – pickup	2	8	6	12	2	8	6	6	2	8	6	6
Truck – flatbed (1-ton)	2	4	6	12	2	4	6	6	2	4	6	6
Truck – mechanics (2-ton)	1	4	6	12	1	4	6	6	1	4	6	6
Truck – fuel	1	2	6	12	1	2	6	6	1	2	6	6
Helicopter – skylift (large)	1	8	6	12	1	8	6	6	1	8	6	6
Wire Installation												
Truck – pickup	6	8	6	68	6	8	6	35	6	8	6	33
Truck – flatbed (1-ton)	10	6	6	68	10	6	6	35	10	6	6	33
Truck – flatbed (2-ton)	2	8	6	68	2	8	6	35	2	8	6	33
Truck – water	1	6	6	68	1	6	6	35	1	6	6	33
Truck – flatbed with boom (5-ton)	6	8	6	68	6	8	6	35	6	8	6	33
Truck – splicing	1	4	6	68	1	4	6	35	1	4	6	33
Truck – semi-trailer	3	8	6	68	3	8	6	35	3	8	6	33
Trailer – flatbed	4	4	6	68	4	4	6	35	4	4	6	33
Trailer – lowboy	3	4	6	68	3	4	6	35	3	4	6	33
Trailer – reel stand	12	4	6	68	12	4	6	35	12	4	6	33
Crane RT (35-ton)	3	2	6	68	3	2	6	35	3	2	6	33
Puller – triple drum	1	2	6	68	1	2	6	35	1	2	6	33
Puller – single drum	1	2	6	68	1	2	6	35	1	2	6	33
Puller – sockline	2	2	6	68	2	2	6	35	2	2	6	33
Tensioner – conductor	1	2	6	68	1	2	6	35	1	2	6	33
Tensioner – shield wire	1	2	6	68	1	2	6	35	1	2	6	33
Dozer – sagging	2	2	6	68	2	2	6	35	2	2	6	33
Dozer – with blade	2	2	6	68	2	2	6	35	2	2	6	33
Backhoe – with bucket	1	2	6	68	1	2	6	35	1	2	6	33
Drill rig – digger	1	2	6	68	1	2	6	35	1	2	6	33
Compressor – pneumatic	1	2	6	68	1	2	6	35	1	2	6	33
Generator – portable (5 horsepower)	2	2	6	68	2	2	6	35	2	2	6	33
Helicopter – pilot line (small)	1	8	6	68	1	8	6	35	1	8	6	33

Table 7
Typical Equipment and Duration of Use for Construction of a 500-kilovolt Transmission Line

Equipment	Spread 1				Spread 2				Spread 3			
	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)	Quantity	Hours per Day	Days per Week	Estimated Duration (weeks)
Restoration												
Truck – pickup	3	6	6	63	3	6	6	33	3	6	6	33
Truck – flatbed (1-ton)	3	6	6	63	3	6	6	33	3	6	6	33
Truck – flatbed (2-ton)	1	4	6	63	1	4	6	33	1	4	6	33
Truck – water	1	6	6	63	1	6	6	33	1	6	6	33
Truck – dump (10Y)	1	6	6	63	1	6	6	33	1	6	6	33
Truck – semi-trailer	1	6	6	63	1	6	6	33	1	6	6	33
Trailer – lowboy	1	6	6	63	1	6	6	33	1	6	6	33
Backhoe – with bucket	1	4	6	63	1	4	6	33	1	4	6	33
Loader – with bucket	1	4	6	63	1	4	6	33	1	4	6	33
Grader – road	1	8	6	63	1	8	6	33	1	8	6	33
Dozer – with blade	1	8	6	63	1	8	6	33	1	8	6	33
Tractor – 4-wheel drive with chisel and/or seeder	1	8	6	63	1	8	6	33	1	8	6	33

NOTES:

[1] Steel erection – conventional: use this set of equipment values if structure erection is considered to be by conventional ground based methods.

[2] Steel erection – helicopter: use this set of equipment values if structure erection is considered to include heavy-lift helicopter methods.

Spread 1 of the Company’s DEIS preferred route, approximately 228 miles consisting of Links W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188

Spread 2 of the Company’s DEIS preferred route, approximately 103 miles consisting of Links U242, U280, U285, U300, U400, U401, U404, U406

Spread 3 of the Company’s DEIS preferred route, approximately 76 miles consisting of Links U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640

For the substation work, the highest level of traffic would be during site grading and foundation installation. It is estimated that 2,000 to 4,000 cubic yards of topsoil would not be suitable for re-use on each site and would have to be disposed of off-site at a remote location. Dump trucks would be leaving and returning to the site constantly each day for the duration of the site grading. Each site would require between 4,000 and 7,000 cubic yards of concrete. Delivering, placing, and finishing concrete is labor intensive. Once concrete placement is complete, traffic on the surrounding roads would subside. Workers would arrive in the morning and leave at the end of the day. The balance of daily traffic would be material deliveries from storerooms, which would probably be one or two trips per day. Each substation would require the delivery of permitted loads such as transformers and/or reactors. Each reactor or transformer bank required would require four large multiple-wheel lowboy trucks. Delivery would be scheduled to match the completion of their respective foundations.

3.6.4 Removal of Facilities and Waste Disposal

Substation and right-of-way construction would generate a variety of solid wastes including concrete, hardware, and wood debris. The solid wastes generated during construction would be recycled or hauled away for disposal at a suitable facility based on their properties. Excavation along the right-of-way and at substations would generate solid wastes that could potentially be used as fill; however, surplus excavated material would be removed for disposal. Excavated material that is clean and dry would be spread along the right-of-way.

The majority of surplus excavated materials associated with substation construction results from spoils created during site grading. Very little of the soil excavated during foundation installation is waste product. Above-grade waste may consist of packing material such as crates, pallets, and paper wrapping to protect equipment during shipping. It is assumed a 12-yard dumpster would be filled once a week with waste material for the duration of each substation project.

3.6.5 Construction Schedule

The Company intends to continue to refine the design of the Gateway South during the agency approval process in order to commence construction immediately when the Project is approved. Final engineering surveys would determine the exact locations of structures, access roads, and other features prior to the start of construction and would be included in the Construction POD. Due to the broad scope of construction, the varied nature of construction activities, and the geographic diversity of the Project area, the Company intends to hire multiple contractors to complete Project work within the projected timeframe and in accordance with industry performance standards. Construction would likely involve multiple construction contracts over a probable 3 to 4-year period ending in December 2020. Multiple spreads would be under construction at the same time. The Company developed a Project construction schedule based on this strategy (Table 8 – Project Duration Schedule). The most construction activity (access disturbance, structure construction, substation expansion, series compensation station development and line stringing) would occur in the first 2 years.

Although the construction rate of progress would be reduced in the winter, it is anticipated that construction would continue through the winter months in the lower-elevation areas of the Project, except during winter storms. In the higher-elevation areas of the Project, winter storms and snow would limit access to the right-of-way. In these areas, it is expected that construction would be suspended on some portions of the right-of-way during the peak winter months and construction resources would either be demobilized or shifted to other segments of the Project.

Transmission-line construction commences with contractor mobilization. The contractor would mobilize equipment and personnel to the construction site at various stages in the Project schedule depending on operational requirements. This would cumulatively require approximately 6 weeks throughout the schedule for Segments 1, 2, and 3. Construction management, engineering support, inspection, materials handling, and administration are required throughout the Project. First, surveyors would start at one end of the segment and stake the locations of access roads. Road construction can start 1 to 2 weeks after the surveyors begin, which may require clearing in higher elevations where tree removal is required prior to road construction. After a couple of weeks of road construction another survey crew can begin staking the structure locations. A week or two after the survey crew starts staking structure locations; excavation of holes for foundations can begin. The installation of the concrete pier foundations would begin immediately after that. The foundations need time to cure and develop to full structural strength (i.e., compression capacity) before lattice structures or mono-pole structures can be installed. A couple weeks after foundation installation has begun, lattice-structure and mono-pole hauling, assembly, and erection can begin. For 345kV H-frame construction, structure assembly and setting can begin immediately after the excavation of holes has begun. The wire installation crews would start approximately 8 to 12 weeks after assembly and erection/setting begins. This would be followed by final cleanup, reclamation, and restoration. Substation construction includes five activities: (1) site grading (grading and access road development); (2) below-grade construction (primarily the installation of foundations; (3) above-grade construction (steel erection and building construction); (4) electrical (installation and termination of control wiring); and (5) testing (functional testing of control and monitoring schemes). Typically, these activities overlap and complement each other, allowing the construction of a substation to proceed more quickly than transmission-line construction. It is estimated that the site-grading activity and access-road work for Gateway South series compensation substations would take 4 to 8 weeks to complete, depending on the size of the site.

Below-grade construction can be completed in 3 months or less for all substations that are expansions of existing substations. In these cases the basic infrastructure is already in place, having been installed with the initial substation and designed for the future expansion requirements. Only the new substations would take longer to complete.

Above-grade construction duration is highly dependent on the level of construction workforce the contractor chooses. Due to the size of each station, many crews can work on steel erection and equipment assembly without interfering with each other. The greatest amount of schedule recovery or acceleration in a station’s construction schedule can be achieved during this timeframe. It is estimated that, for the series compensation substations, the erection of steel, bus assembly, and major equipment assembly can be completed in between 4 and 6 months.

Electrical construction is a long and labor-intensive task. Although multiple crews can work in a yard at any given time, the space in a control building is very limited and would determine the length of this task. In the case of each of these stations, given the size and type of equipment to be installed, there would be miles of cable to be pulled into conduit and duct banks and thousands of connections to be made and double checked prior to the start of testing. The series compensation substations would take longer than existing substations that already have the basic infrastructure in place.

Prior to starting construction, the Company may be required to conduct on-site environmental surveys in accordance with applicable protocols or mitigation measures adopted by BLM and other agencies as Project conditions. Accordingly, adjustments might occur to the Project schedule as necessary to avoid sensitive resources and comply with the approved Construction POD. Pre-construction activities, including pre-construction environmental surveys, materials procurement, design, contracting, right-of-way acquisition, and permitting efforts, are not shown in the summary schedule.

The schedule is predicated upon the Company's ability to complete the following tasks in a timely manner:

- Secure all necessary permit approvals
- Secure agency approval
- Complete biological and cultural survey work
- Construct within environmental time constraints
- Order and receive equipment
- Secure construction contractor resources and associated construction equipment. Maintain continuous construction activity with no delay due to environmental, administrative, or legal issues.

Table 8a
Project Duration Schedule – Months 1 to 8

Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	**2015**																																	
	Month 1				**Month 2**				**Month 3**					**Month 4**				**Month 5**				**Month 6**					**Month 7**				**Month 8**			
	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/30	6/6	6/13	6/20	6/27	7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21	Wk 22	Wk 23	Wk 24	Wk 25	Wk 26	Wk 27	Wk 28	Wk 29	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Inspection	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Project yard(s) layout and make ready for construction	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																		
Receipt and storage and Project materials	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Survey and stake access roads and work areas									1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Construct access roads and structure pads											1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Tree clearing																																		
Install foundations																			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Haul and assemble structures																										1	2	3	4	5	6	7	8	9
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		

Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	**2015**																																	
	Month 1				**Month 2**				**Month 3**					**Month 4**				**Month 5**				**Month 6**					**Month 7**				**Month 8**			
	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/30	6/6	6/13	6/20	6/27	7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21	Wk 22	Wk 23	Wk 24	Wk 25	Wk 26	Wk 27	Wk 28	Wk 29	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Inspection														1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Project yard(s) layout and make ready for construction														1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16					
Receipt and storage and project materials														1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Survey and stake access roads and work areas																							1	2	3	4	5	6	7	8	9	10	11	12
Construct access roads and structure pads																											1	2	3	4	5	6	7	8
Tree clearing																					1	2	3	4	5	6	7	8	9	10	11	12	13	14
Install foundations																																		1
Haul and assemble structures																																		
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		

Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	**2015**																																	
	Month 1				**Month 2**				**Month 3**					**Month 4**				**Month 5**				**Month 6**					**Month 7**				**Month 8**			
	1/3	1/10	1/17	1/24	1/31	2/7	2/14	2/21	2/28	3/7	3/14	3/21	3/28	4/4	4/11	4/18	4/25	5/2	5/9	5/16	5/23	5/30	6/6	6/13	6/20	6/27	7/4	7/11	7/18	7/25	8/1	8/8	8/15	8/22
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204
	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 14	Wk 15	Wk 16	Wk 17	Wk 18	Wk 19	Wk 20	Wk 21	Wk 22	Wk 23	Wk 24	Wk 25	Wk 26	Wk 27	Wk 28	Wk 29	Wk 30	Wk 31	Wk 32	Wk 33	Wk 34
Inspection																															1	2	3	4
Project yard(s) layout and make ready for construction																															1	2	3	4
Receipt and storage and Project materials																															1	2	3	4
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations																																		
Haul and assemble structures																																		
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		

Table 8b
Project Duration Schedule – Months 9 to 16

Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	2015																		2016																
	Month 9					Month 10				Month 11				Month 12					Month 13				Month 14				Month 15					Month 16			
	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	10/24	10/31	11/7	11/14	11/21	11/28	12/5	12/12	12/19	12/26	1/2	1/9	1/16	1/23	1/30	2/6	2/13	2/20	2/27	3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23
	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336	342	348	354	360	366	372	378	384	390	396	402	408	414
	Wk 35	Wk 36	Wk 37	Wk 38	Wk 39	Wk 40	Wk 41	Wk 42	Wk 43	Wk 44	Wk 45	Wk 46	Wk 47	Wk 48	Wk 49	Wk 50	Wk 51	Wk 52	Wk 53	Wk 54	Wk 55	Wk 56	Wk 57	Wk 58	Wk 59	Wk 60	Wk 61	Wk 62	Wk 63	Wk 64	Wk 65	Wk 66	Wk 67	Wk 68	Wk 69
Inspection	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
Project yard(s) layout and make ready for construction	35	36	37	38	39	40	41	42	43	44	45	46	47																						
Receipt and storage and Project materials														48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69
Survey and stake access roads and work areas	35	36	37	38	39	40	41	42	43	44	45	46	47	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
Construct access roads and structure pads	27	28	29	30	31	32	33	34	35	36	37	38	39	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59
Tree clearing	25	26	27	28	29	30	31	32	33	34	35	36	37																						
Install foundations														30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
Haul and assemble structures	17	18	19	20	21	22	23	24	25	26	27	28	29	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
Erect structures	10	11	12	13	14	15	16	17	18	19	20	21	22	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Install overhead optical ground wire, overhead ground wire, and conductors					1	2	3	4	5	6	7	8	9	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Cleanup and restoration													1												1	2	3	4	5	6	7	8	9	10	11

Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	2015																		2016																
	Month 9					Month 10				Month 11				Month 12					Month 13				Month 14				Month 15					Month 16			
	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	10/24	10/31	11/7	11/14	11/21	11/28	12/5	12/12	12/19	12/26	1/2	1/9	1/16	1/23	1/30	2/6	2/13	2/20	2/27	3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23
	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336	342	348	354	360	366	372	378	384	390	396	402	408	414
	Wk 35	Wk 36	Wk 37	Wk 38	Wk 39	Wk 40	Wk 41	Wk 42	Wk 43	Wk 44	Wk 45	Wk 46	Wk 47	Wk 48	Wk 49	Wk 50	Wk 51	Wk 52	Wk 53	Wk 54	Wk 55	Wk 56	Wk 57	Wk 58	Wk 59	Wk 60	Wk 61	Wk 62	Wk 63	Wk 64	Wk 65	Wk 66	Wk 67	Wk 68	Wk 69
Inspection	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Project yard(s) layout and make ready for construction																																			
Receipt and storage and Project materials	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56
Survey and stake access roads and work areas	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Construct access roads and structure pads	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
Tree clearing	15	16	17	18	19	20	21																												
Install foundations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Haul and assemble structures							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Erect structures																1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Install overhead optical ground wire, overhead ground wire, and conductors																											1	2	3	4	5	6	7	8	9
Cleanup and restoration																																			

Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	2015																		2016																
	Month 9					Month 10				Month 11				Month 12					Month 13				Month 14				Month 15					Month 16			
	8/29	9/5	9/12	9/19	9/26	10/3	10/10	10/17	10/24	10/31	11/7	11/14	11/21	11/28	12/5	12/12	12/19	12/26	1/2	1/9	1/16	1/23	1/30	2/6	2/13	2/20	2/27	3/5	3/12	3/19	3/26	4/2	4/9	4/16	4/23
	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294	300	306	312	318	324	330	336	342	348	354	360	366	372	378	384	390	396	402	408	414
	Wk 35	Wk 36	Wk 37	Wk 38	Wk 39	Wk 40	Wk 41	Wk 42	Wk 43	Wk 44	Wk 45	Wk 46	Wk 47	Wk 48	Wk 49	Wk 50	Wk 51	Wk 52	Wk 53	Wk 54	Wk 55	Wk 56	Wk 57	Wk 58	Wk 59	Wk 60	Wk 61	Wk 62	Wk 63	Wk 64	Wk 65	Wk 66	Wk 67	Wk 68	Wk 69
Inspection	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Project yard(s) layout and make ready for construction	5	6	7	8	9	10	11	12	13	14	15	16																							
Receipt and storage and Project materials	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Survey and stake access roads and work areas	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Construct access roads and structure pads								1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Tree clearing																			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Install foundations																																			
Haul and assemble structures																																			
Erect structures																																			
Install overhead optical ground wire, overhead ground wire, and conductors																																			
Cleanup and restoration																																			

Table 8c
Project Duration Schedule – Months 17 to 24

Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	**2016**																																		
	Month 17				**Month 18**					**Month 19**				**Month 20**				**Month 21**					**Month 22**				**Month 23**				**Month 24**				
	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24
	420	426	432	438	444	450	456	462	468	474	480	486	492	498	504	510	516	522	528	534	540	546	552	558	564	570	576	582	588	594	600	606	612	618	624
	Wk 70	Wk 71	Wk 72	Wk 73	Wk 74	Wk 75	Wk 76	Wk 77	Wk 78	Wk 79	Wk 80	Wk 81	Wk 82	Wk 83	Wk 84	Wk 85	Wk 86	Wk 87	Wk 88	Wk 89	Wk 90	Wk 91	Wk 92	Wk 93	Wk 94	Wk 95	Wk 96	Wk 97	Wk 98	Wk 99	Wk 100	Wk 101	Wk 102	Wk 103	Wk 104
Inspection	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
Project yard(s) layout and make ready for construction																																			
Receipt and storage and Project materials	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104
Survey and stake access roads and work areas	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85											
Construct access roads and structure pads	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85									
Tree clearing																																			
Install foundations	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84		
Haul and assemble structures	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Erect structures	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
Install overhead optical ground wire, overhead ground wire, and conductors	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58
Cleanup and restoration	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46

Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	**2016**																																		
	Month 17				**Month 18**					**Month 19**				**Month 20**				**Month 21**					**Month 22**				**Month 23**				**Month 24**				
	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24
	420	426	432	438	444	450	456	462	468	474	480	486	492	498	504	510	516	522	528	534	540	546	552	558	564	570	576	582	588	594	600	606	612	618	624
	Wk 70	Wk 71	Wk 72	Wk 73	Wk 74	Wk 75	Wk 76	Wk 77	Wk 78	Wk 79	Wk 80	Wk 81	Wk 82	Wk 83	Wk 84	Wk 85	Wk 86	Wk 87	Wk 88	Wk 89	Wk 90	Wk 91	Wk 92	Wk 93	Wk 94	Wk 95	Wk 96	Wk 97	Wk 98	Wk 99	Wk 100	Wk 101	Wk 102	Wk 103	Wk 104
Inspection	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91
Project yard(s) layout and make ready for construction																																			
Receipt and storage and Project materials	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82									
Survey and stake access roads and work areas																																			
Construct access roads and structure pads	44	45	46	47																															
Tree clearing																																			
Install foundations	37	38	39	40	41	42																													
Haul and assemble structures	30	31	32	33	34	35	36	37	38	39	40	41	42																						
Erect structures	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37																		
Install overhead optical ground wire, overhead ground wire, and conductors	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35									
Cleanup and restoration			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33

Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	**2016**																																		
	Month 17				**Month 18**					**Month 19**				**Month 20**				**Month 21**					**Month 22**				**Month 23**				**Month 24**				
	4/30	5/7	5/14	5/21	5/28	6/4	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/10	9/17	9/24	10/1	10/8	10/15	10/22	10/29	11/5	11/12	11/19	11/26	12/3	12/10	12/17	12/24
	420	426	432	438	444	450	456	462	468	474	480	486	492	498	504	510	516	522	528	534	540	546	552	558	564	570	576	582	588	594	600	606	612	618	624
	Wk 70	Wk 71	Wk 72	Wk 73	Wk 74	Wk 75	Wk 76	Wk 77	Wk 78	Wk 79	Wk 80	Wk 81	Wk 82	Wk 83	Wk 84	Wk 85	Wk 86	Wk 87	Wk 88	Wk 89	Wk 90	Wk 91	Wk 92	Wk 93	Wk 94	Wk 95	Wk 96	Wk 97	Wk 98	Wk 99	Wk 100	Wk 101	Wk 102	Wk 103	Wk 104
Inspection	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Project yard(s) layout and make ready for construction																																			
Receipt and storage and Project materials	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74
Survey and stake access roads and work areas	36	37	38	39	40	41	42	43	44																										
Construct access roads and structure pads	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44																			
Tree clearing	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32																				
Install foundations							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Haul and assemble structures														1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Erect structures																						1	2	3	4	5	6	7	8	9	10	11	12	13	14
Install overhead optical ground wire, overhead ground wire, and conductors																											1	2	3	4	5	6	7	8	9
Cleanup and restoration																																			

Table 8d
Project Duration Schedule – Months 25 to 32

Spread 1 – 228 Miles (W15, W21, W35, W36, W30, W32, W101, W125, W108, W116, W113, W410, W411, C31, C61, C91, C175, C186, C188)	2017																																	
	Month 25				Month 26				Month 27					Month 28				Month 29				Month 30					Month 31				Month 32			
	12/31	1/7	1/14	1/21	1/28	2/4	2/11	2/18	2/25	3/4	3/11	3/18	3/25	4/1	4/8	4/15	4/22	4/29	5/6	5/13	5/20	5/27	6/3	6/10	6/17	6/24	7/1	7/8	7/15	7/22	7/29	8/5	8/12	8/19
	630	636	642	648	654	660	666	672	678	684	690	696	702	708	714	720	726	732	738	744	750	756	762	768	774	780	786	792	798	804	810	816	822	828
	Wk 105	Wk 106	Wk 107	Wk 108	Wk 109	Wk 110	Wk 111	Wk 112	Wk 113	Wk 114	Wk 115	Wk 116	Wk 117	Wk 118	Wk 119	Wk 120	Wk 121	Wk 122	Wk 123	Wk 124	Wk 125	Wk 126	Wk 127	Wk 128	Wk 129	Wk 130	Wk 131	Wk 132	Wk 133	Wk 134	Wk 135	Wk 136	Wk 137	Wk 138
Inspection	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121																	
Project yard(s) layout and make ready for construction																																		
Receipt and storage and Project materials	105	106	107	108	109	110	111	112	113	114																								
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations																																		
Haul and assemble structures	80	81	82	83	84																													
Erect structures	67	68	69	70	71	72																												
Install overhead optical ground wire, overhead ground wire, and conductors	59	60	61	62	63	64	65	66	67	68																								
Cleanup and restoration	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63																	

Spread 2 – 103 Miles (U242, U280, U285, U300, U400, U401, U404, U406)	2017																																	
	Month 25				Month 26				Month 27					Month 28				Month 29				Month 30					Month 31				Month 32			
	12/31	1/7	1/14	1/21	1/28	2/4	2/11	2/18	2/25	3/4	3/11	3/18	3/25	4/1	4/8	4/15	4/22	4/29	5/6	5/13	5/20	5/27	6/3	6/10	6/17	6/24	7/1	7/8	7/15	7/22	7/29	8/5	8/12	8/19
	630	636	642	648	654	660	666	672	678	684	690	696	702	708	714	720	726	732	738	744	750	756	762	768	774	780	786	792	798	804	810	816	822	828
	Wk 105	Wk 106	Wk 107	Wk 108	Wk 109	Wk 110	Wk 111	Wk 112	Wk 113	Wk 114	Wk 115	Wk 116	Wk 117	Wk 118	Wk 119	Wk 120	Wk 121	Wk 122	Wk 123	Wk 124	Wk 125	Wk 126	Wk 127	Wk 128	Wk 129	Wk 130	Wk 131	Wk 132	Wk 133	Wk 134	Wk 135	Wk 136	Wk 137	Wk 138
Inspection																																		
Project yard(s) layout and make ready for construction																																		
Receipt and storage and Project materials																																		
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations																																		
Haul and assemble structures																																		
Erect structures																																		
Install overhead optical ground wire, overhead ground wire, and conductors																																		
Cleanup and restoration																																		

Spread 3 – 76 Miles (U525, U435, U545, U546, U548, U600, U636, U637, U639, U650, U640)	2017																																	
	Month 25				Month 26				Month 27					Month 28				Month 29				Month 30					Month 31				Month 32			
	12/31	1/7	1/14	1/21	1/28	2/4	2/11	2/18	2/25	3/4	3/11	3/18	3/25	4/1	4/8	4/15	4/22	4/29	5/6	5/13	5/20	5/27	6/3	6/10	6/17	6/24	7/1	7/8	7/15	7/22	7/29	8/5	8/12	8/19
	630	636	642	648	654	660	666	672	678	684	690	696	702	708	714	720	726	732	738	744	750	756	762	768	774	780	786	792	798	804	810	816	822	828
	Wk 105	Wk 106	Wk 107	Wk 108	Wk 109	Wk 110	Wk 111	Wk 112	Wk 113	Wk 114	Wk 115	Wk 116	Wk 117	Wk 118	Wk 119	Wk 120	Wk 121	Wk 122	Wk 123	Wk 124	Wk 125	Wk 126	Wk 127	Wk 128	Wk 129	Wk 130	Wk 131	Wk 132	Wk 133	Wk 134	Wk 135	Wk 136	Wk 137	Wk 138
Inspection	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	
Project yard(s) layout and make ready for construction																																		
Receipt and storage and Project materials	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98										
Survey and stake access roads and work areas																																		
Construct access roads and structure pads																																		
Tree clearing																																		
Install foundations	30	31	32	33																														
Haul and assemble structures	23	24	25	26	27	28	29	30	31	32	33																							
Erect structures	15	16	17	18	19	20	21	22	23	24	25	26	27	28																				
Install overhead optical ground wire, overhead ground wire, and conductors	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33										
Cleanup and restoration	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	

4 SYSTEM OPERATION AND MAINTENANCE

The 500kV transmission lines to be constructed as part of the Project comprise critical infrastructure of the Company's transmission system, and of the western U.S. electrical grid. Limiting the duration of unplanned outages and planning for the use of live-line maintenance techniques to minimize the requirement for any outages is an important part of the design, construction, and operation/maintenance requirements for this Project.

Operation and maintenance activities would be performed in accordance with direction in the approved Construction POD and right-of-way grant.

4.1 Routine System Operation and Maintenance

The goal of the Company is to provide its customers with a reliable supply of electricity while maintaining the overall integrity of the regional electrical grid. The Company's obligation to maintain reliable operation of the electrical system is documented in the Company's agreements with the various states through the Public Service Commissions and is directed through compliance with industry standard codes and practices such as the National Electrical Safety Code (ANSI C2), which governs the design and operation of high-voltage electric-utility systems.

In 2005, Congress passed the Energy Policy Act of 2005, which provided a regulatory basis for the implementation of specific incentives (and penalties) for maintaining reliable service, among other issues. As a result of the passage of the Act, the Federal Energy Regulatory Commission selected the NERC to act as the enforcement agency for compliance with electric utility reliability and operating standards, among other issues. The Company is required to be in compliance with the various reliability standards promulgated through the implementation of the NERC policies and procedures. Additionally, the Company is governed by the WECC standards that may be in addition to or more stringent than those currently required by NERC. In response, the Company has prepared internal operation and maintenance policies and procedures designed to meet the requirements of the NERC, WECC, and the state public utility commissions, while remaining in compliance with the applicable codes and standards with respect to maintaining the reliability of the electrical system.

Operation and maintenance activities would include transmission line patrols, climbing inspections, structure and wire inspection and maintenance, insulator washing in selected areas as needed, and access roads repairs. The Company would keep necessary work areas around structures clear of vegetation and would limit the height of vegetation along the right-of-way. Periodic inspection and maintenance of each of the substations and communications facilities is also a key part of operating and maintaining the electrical system. The following sections provide details on the anticipated operation and maintenance activities for Gateway South.

After the transmission line has been energized, land uses that are compatible with safety regulations would be permitted in and adjacent to the right-of-way. Existing land uses such as agriculture and grazing are generally permitted within the right-of-way. Incompatible land uses within the right-of-way include construction and maintenance of inhabited dwellings and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Land uses that comply with local regulations would be permitted adjacent to the right-of-way. Compatible uses of the right-of-way on public lands would have to be approved by the appropriate agency. Permission to use the easement on private lands would have to be obtained from the utility owning the transmission line.

4.1.1 Routine System Inspection, Maintenance, and Repair

Regular inspection of transmission lines, substations, and support systems is critical for safe, efficient, and economical operation of the Project.

4.1.2 Transmission Line Maintenance

Regular ground and aerial inspections would be performed in accordance with the Company’s established policies and procedures for transmission line inspection and maintenance. The Company’s transmission lines and substations would be inspected for corrosion, equipment misalignment, loose fittings, vandalism, and other mechanical problems. The need for vegetation management would also be determined during inspection patrols.

Inspection of the entire transmission line system would be conducted three times annually. Aerial inspection would be conducted by helicopter on an annual basis and would require two or three crew members, including the pilot. Detailed ground inspections would take place on a semi-annual basis using existing access roads to each structure. Ground inspection would use four-wheel-drive trucks or four-wheel-drive ATVs. The inspector would assess the condition of the transmission line and hardware to determine if any components need to be repaired or replaced, or if other conditions exist that require maintenance or modification activities. The inspector also would note any unauthorized encroachments and trash dumping on the right-of-way that could constitute a safety hazard. The inspector would access each of the structure locations along each line and use binoculars and spotting scopes to perform this inspection.

4.1.3 Hardware Maintenance and Repairs

Routine maintenance activities are ordinary maintenance tasks that historically have been performed and are regularly carried out on a routine basis. The work performed typically is repair or replacement of individual components (no new ground disturbance), performed by relatively small crews using a minimum of equipment, and usually is conducted within a period from a few hours up to a few days. Work requires access to the damaged portion of the line to allow for a safe and efficient repair of the facility. Equipment required for this work may include four-wheel-drive trucks, material (flatbed) trucks, cranes, bucket trucks (low-reach), boom trucks (high-reach), or man lifts. This work is scheduled and typically is required due to issues found during inspections. Typical items that may require periodic replacement on a 500kV structure include insulators, hardware, or structure members. It is expected that these replacements would be required infrequently. Guys will be inspected during routine annual inspections for the transmission line. Occasionally, guys may need to be tightened. This maintenance will be conducted during routine annual maintenance. The presence of guys will have no additional impact associated with ongoing operations and maintenance.

The Company plans to conduct maintenance on the critical 500kV and 345kV system using live-line maintenance techniques. Maintenance on the transmission lines can be completed safely using live-line techniques, thereby avoiding an outage to the critical transmission-line infrastructure. High-reach bucket trucks along with other equipment are used to conduct these activities.

For the 345kV and 500kV structures, this requires that adequate space be available at each structure site so that the high reach bucket truck can be positioned to one side or the other of the structure and reach up and over the lower phases to access the upper center phase for live-line maintenance procedures.

For the 345kV H-frame structures, this requires that adequate space be available at each structure site so that a bucket truck can be positioned to access the outside phases. To allow room at each structure for these activities, in low-slope areas, a pad area of 250 feet (right-of-way width) by 140 feet is required with the structure in the center for the single-circuit 500kV structure, and 150 by 100 feet for the 345kV H-frame structure. Figures 14 and 15 depict the space requirements for live-line maintenance. The size and location of these required pads near the structures may vary depending on the side slope and access road at each site. The work areas and pads would be cleared to the extent needed to safely complete the work. These pads would remain in place after construction, but would be revegetated after the construction has been completed.

4.1.4 Access Road and Work Area Repair

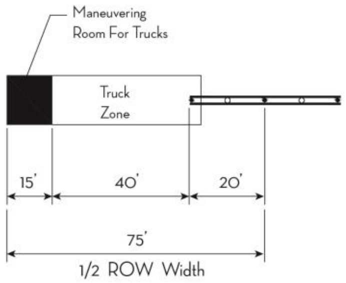
Right-of-way repairs include grading, vegetation management of existing maintenance access roads and work areas, and spot repair of sites subject to flooding or scouring. All road-maintenance standards, such as maintaining cross-road drainage and replacing road-drainage structures, would be compliant with those of the agency managing the land. Required equipment may include a grader, backhoe, four-wheel-drive pickup truck, and a cat-loader or bulldozer. The cat-loader has steel tracks whereas the grader, backhoe, and truck typically have rubber tires. Repair of the right-of-way would be scheduled as a result of line inspections, or would occur in response to an emergency situation. Scheduling of these activities would attempt to adhere to specific biological seasonal restriction timeframes identified in the Construction POD and would be coordinated ahead of time with land-management agency unless it is an emergency situation.

4.1.5 Vegetation Management

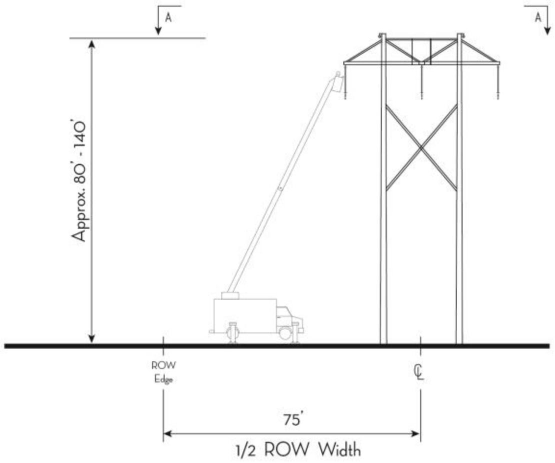
The Company must maintain work areas adjacent to electrical transmission structures and along the right-of-way for vehicle and equipment access required for operations, maintenance, and repair, including for live-line maintenance activities as described above under Section 4.1.3 – Hardware Maintenance and Repairs. Shrubs and other obstructions would be removed regularly near structures to facilitate inspection and maintenance of equipment and to ensure system reliability.

Vegetation management practices along the right-of-way would be in accordance with the Company clearing specifications and vegetation management plans (PacifiCorp 2007). Much of the transmission-line alternative routes traverse arid country characterized by low-growing vegetation, while higher elevations receive more precipitation and exhibit more vegetation. The wire-border zone method to controlling vegetation is an approach used by the Company (PacifiCorp 2007). This method results in two zones of clearing and revegetation. The wire zone is the linear area along the right-of-way under the wires and extending 10 feet outside of the outermost phase conductor. After initial clearing, vegetation in the wire zone would be maintained to consist of native grasses, legumes, herbs, ferns, and other low-growing shrubs that remain under 5-feet tall at maturity. The border zone is the linear area along each side of the right-of-way extending from the wire zone to the edge of the right-of-way.

Vegetation in the border zone would be maintained to consist of tall shrubs or short trees (up to 25-feet tall at maturity), grasses, and forbs. These cover/herbaceous plants benefit the right-of-way by competing with and excluding undesirable plants. The width of the wire and border zones is depicted in Figure 16 for the 345kV H-frame and 500kV single-circuit structure line segments. During operations, vegetation growth would be monitored and managed to maintain the wire-border zone objectives. When conductor ground clearance is greater than 50 feet, for example a canyon or ravine crossing with high ground clearance at mid-span, trees and shrubs would be left in place as long as the conductor clearance to the vegetation tops is 50 feet or more (Figure 17).

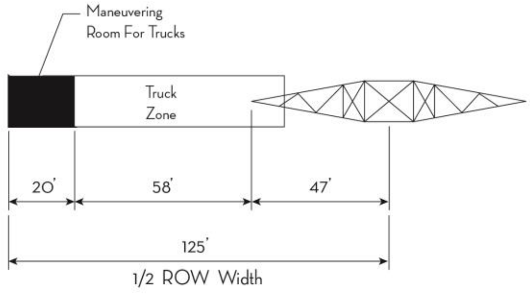


Section A-A
N.T.S.



Profile
N.T.S.

Figure 14 Live-line Maintenance Space Requirements, Single-circuit 345-kilovolt Line



Section A-A
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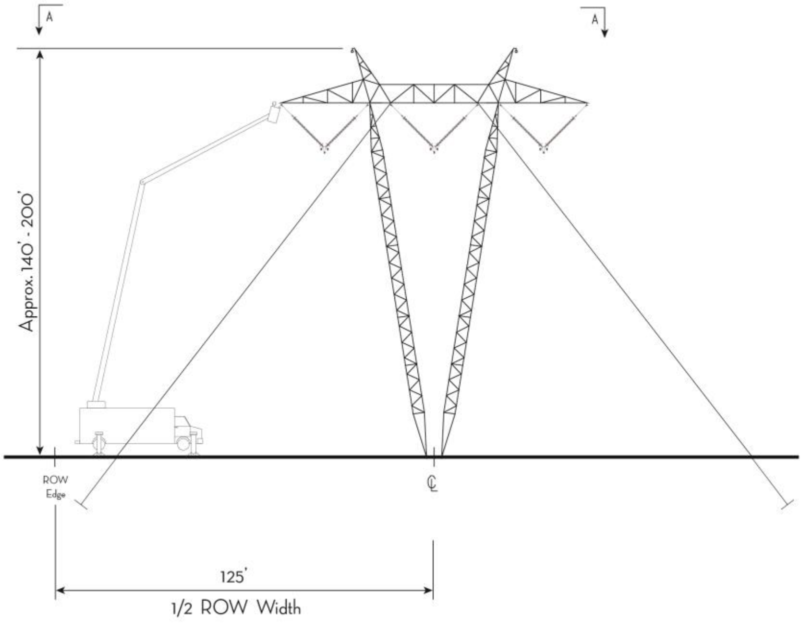


Profile
N.T.S.

Figure 15 Live-line Maintenance Space Requirements, Single-circuit 500-kilovolt Line

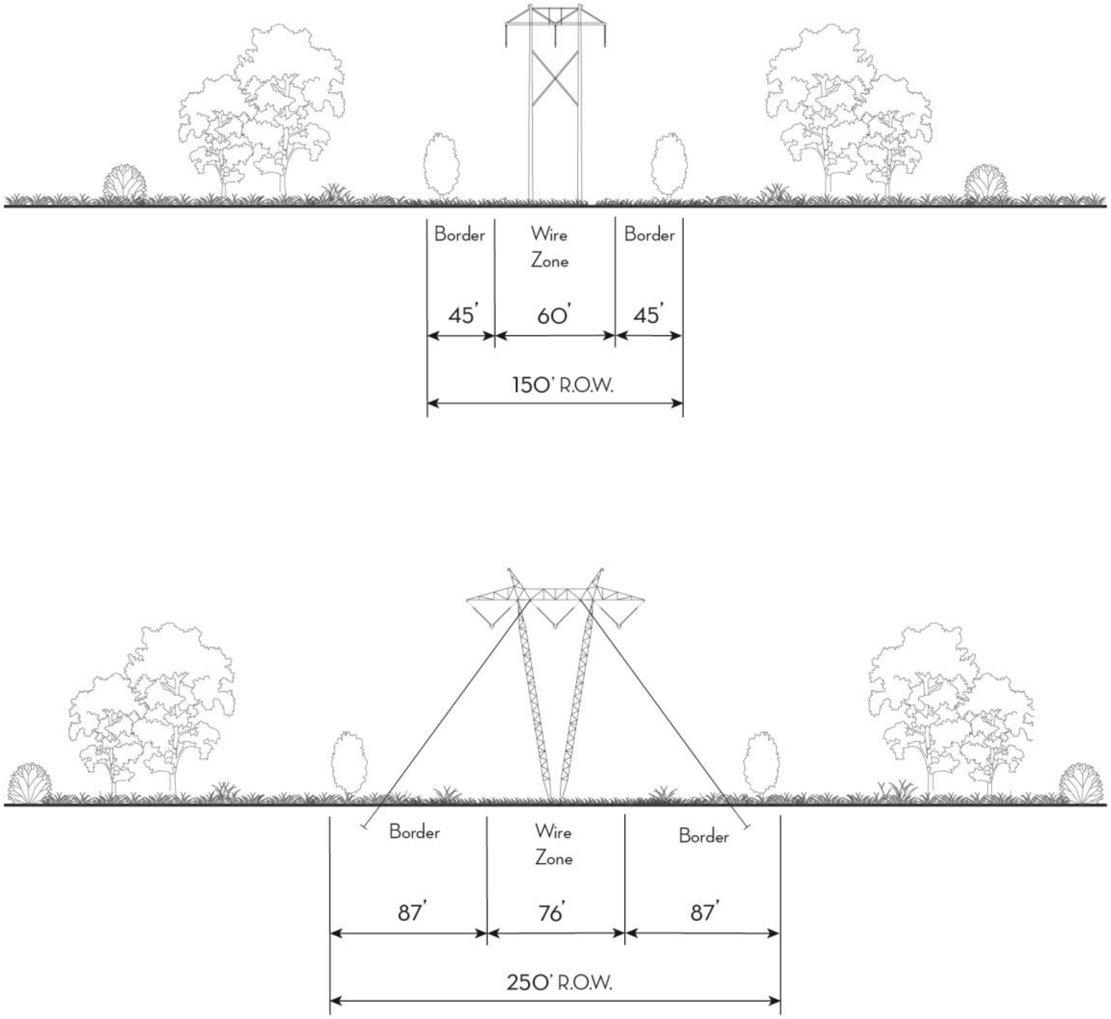
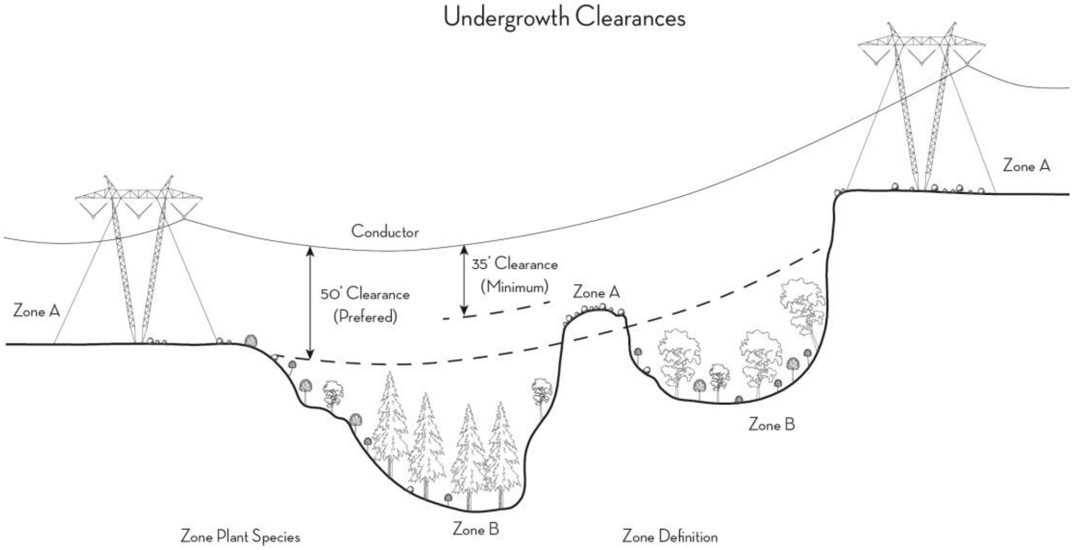


Figure 16 Single-circuit 345-kilovolt Line (top), Single-circuit 500-kilovolt Line (bottom)



Zone Plant Species

Zone A: Grasses, legurnes, herbs, ferrs and low growing shrubs.

Zone B: all deciduous and conifer trees.

Zone Definition

Zone A: When the conductor to ground clearance is less than 50', all tree species should be removed.

Zone B: When the conductor to ground clearance is greater than 50', all tree species should be removed if they have less than 50' of clearance, 35' minimum.

Figure 17 Right-of-way Vegetation Management in Steep Terrain

4.1.6 Substation and Regeneration Station Maintenance

Substation and regeneration station monitoring and control functions are performed remotely from the Company's central operations facilities located at Company's operation center in Portland, Oregon. Unauthorized entry into substations or regeneration stations is prevented with the provision of fencing and locked gates. Warning signs would be posted and entry to the operating facilities would be restricted to authorized personnel. Gateway South substations and regeneration stations would not be staffed; however, a remotely monitored security system would be installed. Several forms of security are planned for each of the locations, although the security arrangements at each of the substations or regeneration stations may differ somewhat. Security measures may include fire detection in the control building via the remote monitoring system; alarming for forced entry; and a perimeter security system coupled with remote sensing infrared camera equipment in the fenced area of the station to provide visual observation/confirmation to the system operator of disturbances at the fence line.

Maintenance activities include equipment testing, equipment monitoring and repair, and emergency and routine procedures for service continuity and preventive maintenance. It is anticipated that maintenance at each substation would require approximately six trips per year by a two- to four-person crew. Routine operations would require one or two workers in a light utility truck to visit the substations monthly. Typically, once per year a major maintenance inspection would take place requiring up to 15 personnel for 1 to 3 weeks. Regeneration stations would be visited every 2 to 3 months by one individual in a light truck to inspect the facilities. Annual maintenance would be performed by a two man crew in a light truck over a 2- to 5-day period. If substation landscaping is required by the permitting agency, drought-tolerant plant materials would be used to minimize watering requirements after plant establishment.

Safety lighting at the substations would be provided inside the substation fence for the purpose of emergency repair work. Because night activities are not expected to occur more than once per year, the safety lighting inside the substation fence normally would be turned off. One floodlight, mounted near the entry gate to safely illuminate the substation entry gate, may be left on during nighttime hours.

4.2 Emergency Response

The operation of the system is remotely managed and monitored from control rooms at the Company’s operation center in Portland, Oregon. Electrical outages or variations from normal operating protocols would be sensed and reported at these operation centers. As well, the substations are equipped with remote monitoring, proximity alarms, and in some cases video surveillance.

The implementation of routine operation and maintenance activities on powerlines would minimize the need for most emergency repairs. Emergency maintenance activities are often those activities necessary to repair natural hazard, fire, or human-caused damages to a line. Such work is required to eliminate a safety hazard, prevent imminent damage to the powerline, or restore service if there is an outage. In an emergency, the Company must respond as quickly as possible to restore power.

The equipment necessary to accomplish emergency repairs is similar to that required to conduct routine maintenance, in most cases. Emergency response to outages may require additional equipment to complete the repairs. For example, where the site of the outage is remote, helicopters may be used to respond quickly to emergencies. Emergency vehicle access to private property also would be maintained.

In practice, as soon as an incident is detected, the control-room dispatchers would notify the responsible operations staff in the area(s) affected and crews and equipment would be organized and dispatched to respond to the incident.

4.2.1 Fire Protection

All federal, state, and county laws, ordinances, rules, and regulations pertaining to fire prevention and suppression would be strictly adhered to. All personnel would be advised of their responsibilities under the applicable fire laws and regulations.

When working on public or National Forest System land, the Company’s employees and contractor’s vehicles would be equipped with approved suppression tools and equipment. The Applicant or their construction contractor would notify local fire authorities and the BLM or USFS (as appropriate) if a Project-related fire occurs within or adjacent to a construction area a complete fire protection plan would be developed as part of the Construction POD.

If the Company becomes aware of an emergency situation that is caused by a fire on or threatening BLM- or USFS-managed land and that could damage the transmission lines or its operation, it would notify the appropriate agency and emergency office contact. Specific construction-related activities and safety measures would be implemented during construction of the transmission line to prevent fires and to ensure quick response and suppression if a fire occurs. Typical practices to prevent fires during construction and maintenance/repair activities include brush clearing prior to work, prohibit burning of slash, stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, providing “fire behavior” training to all pertinent personnel, keeping vehicles on or within designated roads or work areas, equip all construction equipment operating with internal combustion engines with spark arresters, and providing fire suppression equipment and emergency notification numbers at each construction site.

5 DECOMMISSIONING

The proposed transmission line would have a projected operational life of at least 50 years or longer. At the end of the useful life of the Project and if the facility were no longer required, the transmission line would be removed from service. Prior to the decommissioning and 2 years prior to such event, the Company would notify the authorizing agency of their intent to terminate right-of-way and would develop a reclamation plan. The reclamation plan would be reviewed and approved by the agencies and a reclamation bond would be posted and any required NEPA completed prior to commencing any abandonment actions. At such time, conductors, insulators, and hardware would be dismantled and removed from the right-of-way, according to the agency-approved plan. Structures would be removed and foundations removed to below ground surface.

Following removal of the transmission-line structures and equipment from the right-of-way, any areas disturbed during line dismantling would be restored and rehabilitated in accordance with the approved reclamation plan. In the same way, if a substation is no longer required, the substation structures and equipment would be dismantled and removed from the site. The station structures would be disassembled and either re-used at another station or sold for scrap. Major equipment such as breakers, transformers, and reactors would be removed, refurbished, and stored for use at another facility. Foundations would be either abandoned in-place or cut off below ground level and buried according to the approved reclamation plan.

The Company describes roads necessary for the operation and maintenance of transmission lines as access roads, with the sole purpose of providing maintenance crews access to the transmission lines. These roads would not exist if the transmission lines did not exist. In contrast, access roads serve a broader purpose, such as contributing to the federal, county, or state road systems. Access roads provide direct or indirect access to the transmission lines, but that access is not their primary purpose. The Company is responsible for the reclamation of access roads following abandonment and in accordance with the land-management agency’s or landowner’s direction, but is not responsible for reclamation of access roads unless mutually agreed upon by the Company and the landowner or required by the land-management agency. Access roads would be decommissioned following removal of the structures and lines, and may be decommissioned while the lines are in-service if they are determined to be no longer needed.

The Company may decommission access roads by (1) entering into an agreement with the BLM or USFS under which the agencies restore the road located on federal lands and is reimbursed for costs by the Company or (2) the Company or its contractor implement restoration measures as described below.

When an access road has been identified as no longer needed, the road would be reclaimed and seeded as soon as possible during the optimal seeding season. In some cases, reseeding may not be necessary, given the existing amount of soil compaction and vegetation currently in place. Where required by the land-management agency, compacted areas would be ripped and appropriate sediment control measures would be implemented.

Restoration and reclamation of the Project right-of-way would be in accordance with Section 3.2.8 – Site Reclamation and in accordance with the Project Construction POD.

REFERENCES

Institute of Electrical and Electronics Engineers (IEEE). 2007. National Electric Safety Code. IEEE Standards Association. New York, New York.

PacifiCorp. 2007. Transmission and Distribution Vegetation Management Program: Specification Manual. PacifiCorp System Forester. Salt Lake City, Utah. June 1.

Attachment A – Access Road Standards

Avian-Safe Transmission Structures

A. Scope

This standard provides information regarding the protection of birds of prey (raptors) and other large birds from electrocution resulting from contact with overhead transmission power lines.

B. Background and Regulations

Raptors and other large birds can get electrocuted from coming into contact with overhead power lines. In addition to bird mortalities, such electrocutions can cause interruption of power, resulting in reduced reliability and restoration costs. Various government agencies, conservation groups and the general public demand both higher service reliability and better protection of avian populations and their habitats. PacifiCorp's Bird Management Program and Avian Protection Plans use proactive, reactive and preventative measures to reduce bird mortalities and bird-related outages. Additional information can be found on the Environmental Services intranet website.

The following federal laws in the U.S. Protect almost all avian species:

- The Migratory Bird Treaty Act (MBTA) of 1918
- The Bald and Golden Eagle Protection Act of 1940
- The Endangered Species Act (ESA) of 1973

The MBTA protects over 800 species of native North American migratory birds, with the other two acts placing further emphasis on preservation of eagles and endangered species of birds. Failure to comply with these laws can result in substantial fines and criminal prosecution. Therefore transmission system owners must actively attempt to prevent avian electrocutions.

C. Avian Electrocutions

Birds can be electrocuted by simultaneously contacting two energized conductors or an energized conductor and grounded structures, conductors, hardware, or equipment. Electrocutions may occur when the bird is landing, perching or taking off. The electrical design factor most crucial to avian electrocutions on structures is the physical seperation between energized and/or grounded components that can be bridged by birds. As a general, rule electrocutions occur on structures with the following:

1. Phase conductors separated by less than the wrist-to-wrist distance or height of a bird. See Figure 1.
2. Grounded hardware (e.g. grounded wires, bolts, etc.) separated from and energized phase conductor by less than the wrist-to-wrist distance or height of a bird.

Dry feathers provide insulation, so birds must typically contact electrical equipment with fleshy parts that are conductive for electrocution to occur. Fleshy parts include the feet, mouth bill and the wrists from which the primary feathers originate. For a large golden eagle with a 90″ wingspan, the distance from the fleshy tip of one wrist to the tip of the other can measure up to 42 inches; the height (head to foot) of an eagle can reach up to 28 inches.

Deviation from this standard requires advanced approval. Contact the standards engineering manager for approval process and forms.

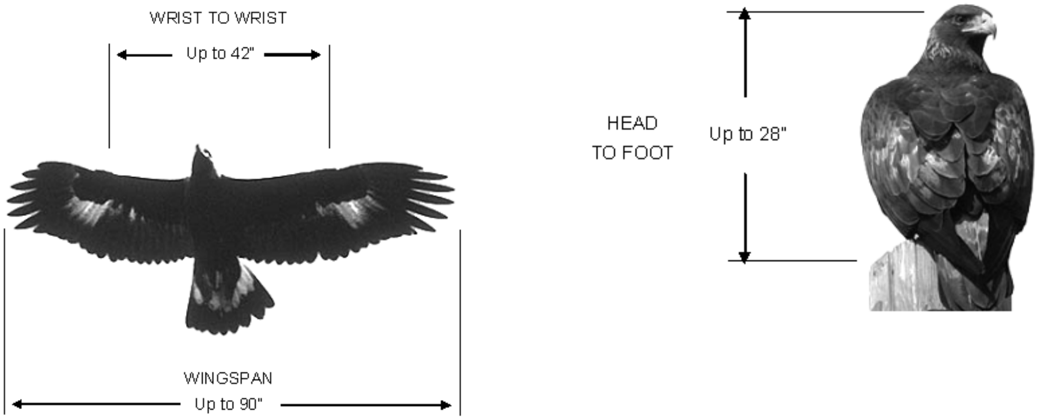
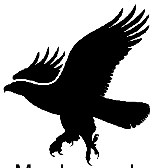


Figure 1 — Typical eagle dimensions

D. Avian-Safe Symbol

“Avian-Safe” structures have been designed to provide adequate distances between energized and/or grounded components in order to allow birds to perch without risk of electrocution. Avian-safe overhead transmission construction standards are marked at the top of the first page with the symbol shown in Figure 2.



May be used
In raptor areas

Figure 2 — Avian-safe symbol

E. Avian Protection

Transmission structures generally have sufficient separation between phases, but there are many shielded structures that do not have adequate separation between energized and grounded components. Installing avian protection devices, such as covers, can greatly reduce bird fatalities. This method of protection is preferred for existing structures because of lesser cost of retrofitting and no line outage.

For new construction, the preferred method of protection is to provide adequate horizontal and vertical separation between all energized and grounded components of the structure, and/or between phases, such that large birds cannot bridge that distance.

The industry standard for avian protection on power lines, which is also used by PacifiCorp, is **60 inches of horizontal separation** and **40 inches of vertical separation.**

These clearances shall apply to all grounded structures such as concrete, steel, or grounded wood poles, or where phase-to-phase distance is inadequate. The separations are intended to allow sufficient clearance for an eagle. Applying this standard will

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also protect smaller birds, such as ospreys, hawks, owls, wading birds and song birds. Several transmission structure types with minimum distances labeled are shown in Figure 3 and Figure 4.

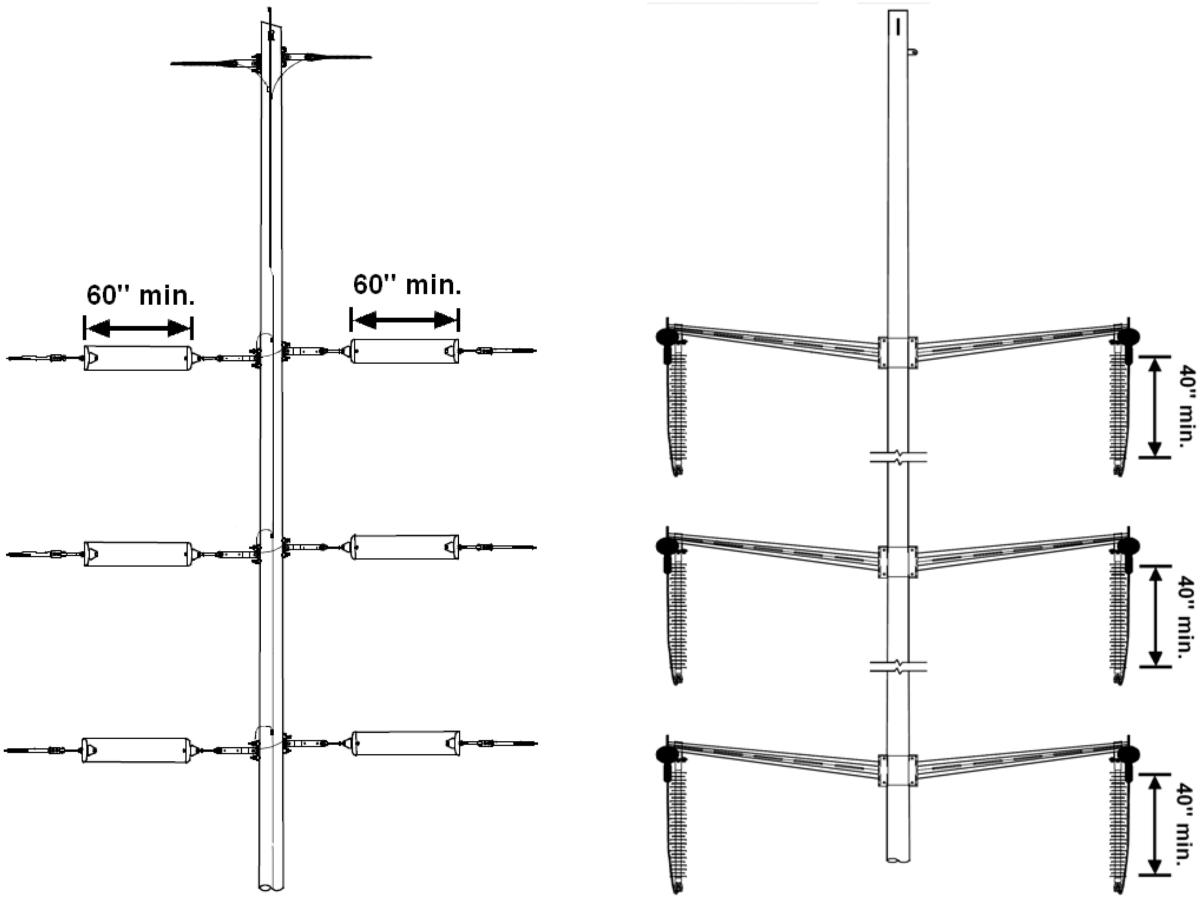

Figure 3 — Deadend transmission structures showing minimum required distances

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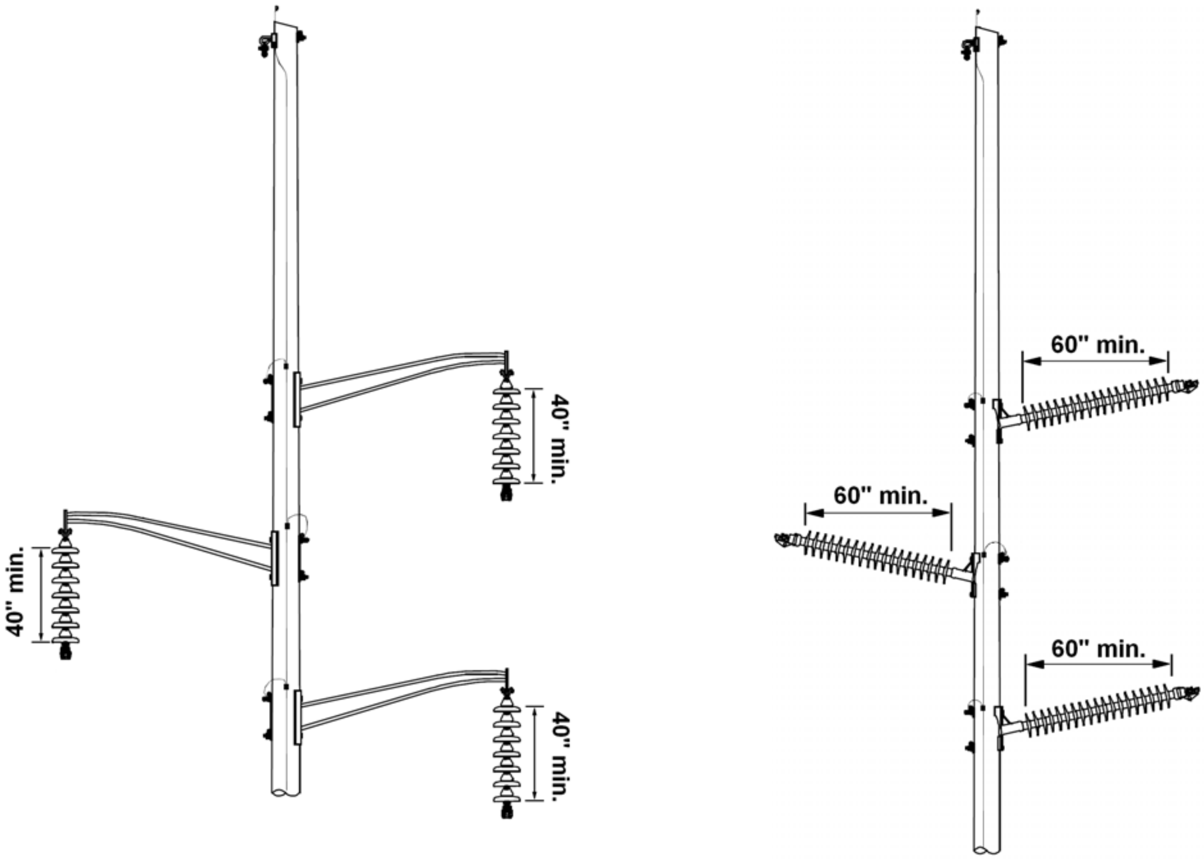

Figure 4 — Tangent transmission structures showing minimum required distances

The required minimum distances between energized conductors and grounded equipment apply to grounded structures only. There are two main types of transmission poles which fall under this category:

- Steel or concrete poles, which are always grounded.
- *Shielded* wood poles, which have a grounded wire running the length of the pole with all hardware bonded.

Unshielded wood poles do not have a grounding wire running the length of the pole, and birds do not get electrocuted by contacting the pole and energized conductor simultaneously.

The minimum lengths discussed in this standard are intended to guide design and installation of transmission structures from 46/69 kV through 138 kV. Transmission structures for 161 kV and above have sufficiently long insulators to meet all the minimum clearance requirements described above.

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F. Reporting Mortalities and Problem Nests

Dead birds of protected species found on, below or near PacifiCorp distribution and transmission facilities or substations must be reported using PacifiCorp's Bird Mortality Tracking System (BMTS). All required data for entry into the BMTS should be collected by field personnel that discovered the mortality.

All birds, excluding eagles and threatened or endangered species, should be buried on site after data is collected, unless the carcass has a leg band, radio transmitter, neck collar or other special marker. If it is not possible to bury or dispose of the carcass, leave it on site and notify the local manager. A mortality record must be entered into the BMTS and appropriate remedial action taken, as described below.

The BMTS website may be found here:

PacifiCorp Intranet Home Page
→ *Environment*
→ *Environmental Resources*
→ *PP or RMP Environmental Support*
→ *Avian*
→ *Bird Mortality/Problem Nest Incident Reporting*

Click "Add Mortality" to review all the information required in reporting a bird mortality.

Eagle or other endangered/threatened bird mortalities must be reported to Environmental Services immediately upon discovery. Environmental Services will notify USFWS of dead eagles, which will be retrieved by the agency. File a report using the BMTS as described above, including detailed directions to the site for retrieval of the carcass. The local manager must be notified immediately regarding any eagle, endangered/threatened species or marked bird mortalities. Endangered and threatened species that may be seen at PacifiCorp's facilities include California condor, bald eagle, whooping crane and spotted owl.

Although electrocution of birds nesting on power line equipment is relatively rare, nests may cause operational problems. Problem nests may also be reported using the BMTS Nests which do not interfere with power operations should be left in place. In most cases, a permit is required to remove or relocate a nest. If a nest is causing immediate danger of fire, safety risk to crew, risk of bird electrocution or threat to human life or property, then PacifiCorp crews may take immediate action prior to receiving a permit. In this case, Environmental Services must be notified immediately to report "imminent danger" action taken.

Training presentation on bird protection are conducted by Environmental Services for field personnel. Training materials are also available on the Environment intranet website. Environmental Services staff will assist with site-specific prescriptions as necessary. Each district is responsible for ensuring that all employees likely to find dead birds or nests are familiar with the proper procedures for reporting and documentation, and other aspects of PacifiCorp's Bird Management Program.

The BMTS is a searchable database of bird mortalities and problem nests. To avoid entering redundant mortalities or nests, search for past reported incidents and confirm that it has not already been reported.

Deviation from this standard requires advanced approval. Contact the standards engineering manager for approval process and forms.

G. New Construction and Maintenance

All new or rebuilt power lines and poles shall be built to avian-safe standards.

Poles where a protected bird was killed must be retrofitted to prevent additional electrocutions. Retrofitting could include the following:

- Applying covers
- Installing longer insulators
- Reframing or replacing the structure

For more information on all of the avian-safe topics discussed here, refer to PacifiCorp's Bird Management Program Guidelines and other related documents on the Avian Program site:

PacifiCorp Intranet Home Page
- → *Environment*
  - → *Environmental Resources*
    - → *PP or RMP Environmental Support*
      - → *Avian*
        - → *Bird Management Guidance Documents*
        - → *Bird Management Policies*
        - → *Raptor Safe Construction Standards*

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Engineer (A. Shkuratkov): A.S.
Sr. Engineer (C. Wright): CLW

Roads—Clearing for Installation and Maintenance of Roads

A. Scope

This standard supplies information about clearing necessary for installation of transmission line access and rights-of-way roads. Clearing width for the construction of new roads or maintenance of existing roads shall be three (3) feet beyond the edge of the roadway on level ground. On hillside cuts or fills, the clearing shall be sufficient width to install the cut or fill without interference. (See figure 1).

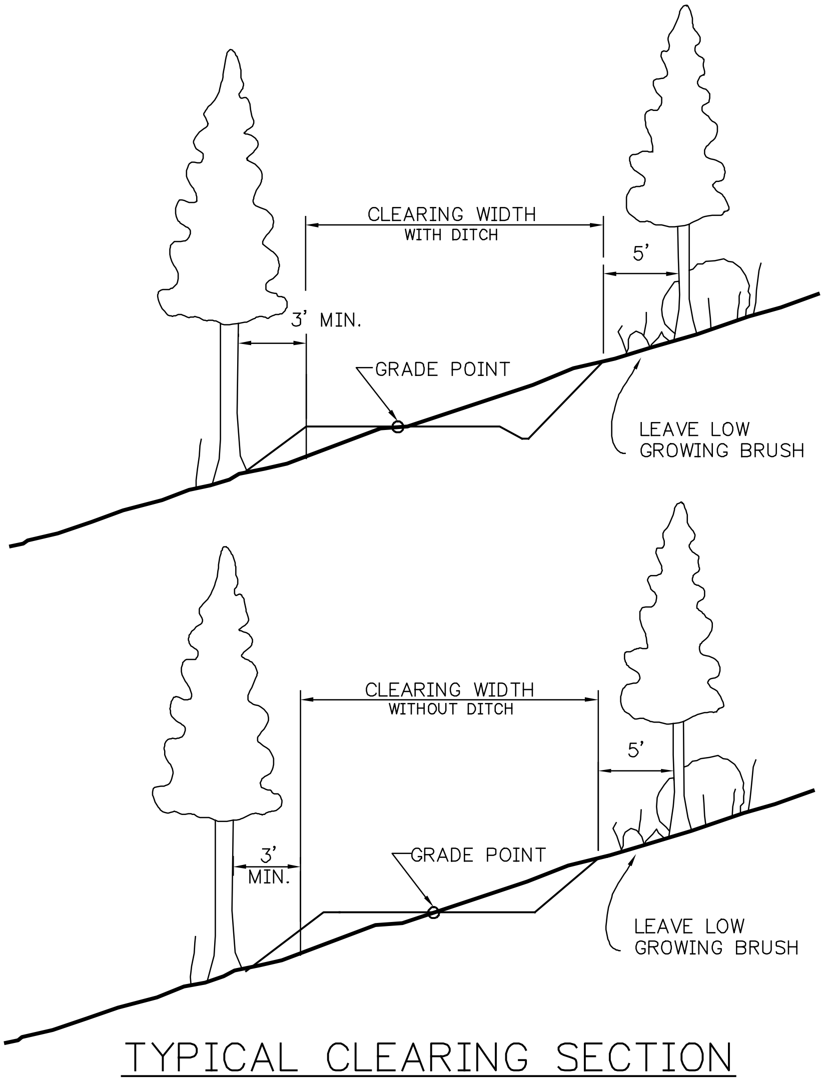

Figure 1—Road Clearing Cross Section

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Engineer (C. Wright): CLW
Stds Manager (D. Asgharian): DDA

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Table 1 — Clearing Width

Side Slope (%)	Cut Slope	Clearing Width (ft)	Clearing Width (ft)	Clearing Width For Turnouts (ft)	
		w/o Ditch	w/ Ditch	w/o Ditch	w/ Ditch
0		24	27	30	33
10	1.5 : 1	26	30	32	35
20	1.5 : 1	27	31	33	37
30	1.5 : 1	29	32	36	40
40	1.5 : 1	31	35	39	43
50	1.5 : 1	34	39	44	49
60	3/4 : 1±	37	44	48	55
70	3/4 : 1±	45	52	55	62
80	1/2 : 1±	37	43	47	53

Notes:

1. See specifications for additional information on clearing and grubbing.
2. ± full bench
3. For clearing purpose only.

Where it is necessary to fell trees in streamside areas, fell trees away from streams, retaining all non-hazardous vegetation. Do not skid trees in, through, or across streams.

All operations on federal government property shall comply with applicable statutes and regulations, including stipulations contained in right-of-way permits.

No trees shall be cut or removed before they are marked for removal.

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Engineer (C. Wright): CLW
Stds Manager (D. Asgharian): DDA

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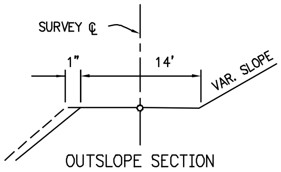
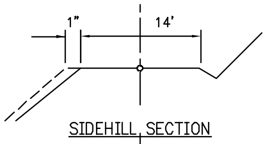
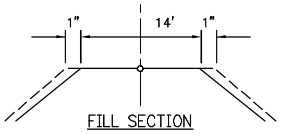
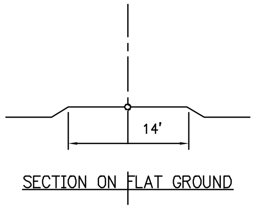
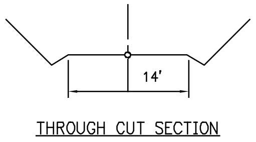
Roads—Construction

A. Scope

This standard provides information about constructing transmission line access. All road construction/improvements, fords, structure/equipment landings, and lay-down yards shall be held to a minimum. On level terrain, road construction may only require back-dragging a blade to remove brush to facilitate construction. In undulating or mountainous terrain the following standards shall apply.

B. Index

The index below provides a quick reference to detailed figures contained in this standard for road construction with varying slopes and conditions.

Referenced Road Cross Section	ACCESS ROAD SECTION
Figure 2	 SURVEY ℄ 1" 14' VAR. SLOPE OUTSLOPE SECTION (W/O DITCHING)
Figure 3 Figure 4 Figure 5	
Figure 2	
Figure 2	
Figure 2	

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Engineer (C. Wright): CLW

Standards Manager (G. Lyons):

C. Planning

Before construction can take place. the road system must be planned and located properly. Poor planning or road location is associated with the following most common causes of road failure (Furniss et al. 1991):

- Improper placement and construction of road fills.
- Insufficient culvert sizes.
- Very steep road grades.
- Improper placement or sidecast of excess materials.
- Removal of slope support by undercutting.
- Altering drainage by interception and concentration of surface and subsurface flows.

A plan showing existing and new road locations shall be developed and shall be shown on the company's access road charts, plan maps, and transportation plan map. Road locations shall be marked on the ground by survey stakes and blue-and-white, striped flagging. GPS coordinates shall be obtained to define the road center-line. These coordinates shall be used to create the transportation plan map. Road information shall also be placed on transmission line plan maps.

In the event of conflict between the drawings and the staked locations, the latter shall take precedence and transportation plan maps and the transmission line plan maps shall be revised accordingly. Any culverts and gates listed in access road charts are required. Fords, drainage improvements, rip-rap fills and crushed rock requirements listed in the access road charts are anticipated; however, requirements will be determined based on actual site conditions encountered. If changes are made in the field, the maps shall be revised to show these changes.

Because roads are long-term features, their location must be carefully chosen to provide safe access, avoid long-term maintenance problems, reduce potential for degrading water quality, and minimize costs over the short and long term. For more information see the references in Section H.

D. Road Construction

Roads shall be constructed in a manner that will support equipment for construction of the transmission line and to provide access roads for line inspection and maintenance equipment after the line has been constructed.

All construction access roads on federally managed public lands are subject to approval prior to construction. Other federal, state, and local landowners may require approvals before road construction commences on their property. Where side slopes exceed 60 percent, a full bench cut will be reburied. No side-casting of material will be allowed in these areas; end-haul of material will be required to a designated location approved by the federal agency or other property owner. Close coordination with the federal agency will be required.

The detail drawings provided in this standard for completing cuts and fills, providing drainage, and installing culverts are furnished as guidelines for the road construction. Actual road construction cut slopes, fill slopes, drainage requirements, rip-rap, and crushed rock needs will be determined during construction based on site conditions. Cut and fill quantities shall balance when possible, reducing the material removed or brought in for road completion.

During road construction, consideration shall be given to restoration required after construction completion, including re-vegetation, rock cover, and other drainage and erosion control factors. Clearing and grading shall be minimized to reduce the restoration requirements for disturbed areas. The visual impact of roads on the surrounding areas shall be considered at all times during construction.

Crushed rock shall be sound, hard, durable, angular, or sub-angular rock, suitable for road base courses. Crushed rock shall be well graded 2″ to 1/4″ size (3″ to minus-size skip-graded is a minimum acceptable substitute).

Rip Rap shall be sound, hard, durable, rock ranging in size from 2″ to 8″ as specified on drawings and as required by conditions.

Any improvements made, including spur roads, fords, bridges, equipment landings and lay-down areas, shall be held to a minimum. Following completion of the work, the removal of these improvements shall be at the discretion of company or its representative.

Roads shall be sufficiently wide, but not less than 14′ in width. The construction shall provide bench cuts, grading, filling, compaction, and ditches necessary to accommodate heavy construction equipment and other heavily loaded vehicles. Roads shall be installed in accordance with the figures in this standard.

All roads shall be constructed with a smooth, uniform surface and shall be outsloped where practical to provide drainage and minimum erosion. Avoid outsloped roads where they will direct runoff onto erodible fill, embankments, or where they would cause off-camber curves. Where outsloping is not practical, sufficient water dips, water bars, or ditching, shall be installed as shown in the Section E of this standard. See standards TA 503, *Roads—Water Bars and Water Dips* and TA 504, *Roads—Culvert Installation* for further detail on proper drainage.

Outsloping a road means building the road surface so that it is tilted outward 2-3 percent so water can run off the road surface (see Figure 1). Outsloping works well under the right conditions. The following conditions are favorable for use of outsloped roads with no ditch:

- Short back slopes.
- Terrain slope less than 20 percent.
- Road grades steeper than 3 percent.
- Seasonal road use.
- Light traffic.
- Fast re-vegetation of cut and fill slopes.

Outslopes become a problem if roads are not maintained when ruts begin to form. The ruts will then act as channels.

The following conditions are unfavorable for outsloping:

- Long back slopes.

- Terrain steeper than 20 percent.
- Steep, continuous road grade.
- Where ruts occur and allow water to concentrate and run along the road.
- Where winter hauling is required.

To minimize rutting and erosion of the right-of-way, road construction shall be completed during predominantly dry conditions. Fills, which will essentially consist of native soils, shall not be made when the moisture content of the soils will not permit adequate compaction.

As a minimum level of compaction, common fill shall be placed in 12″-thick, loose lifts and each lift compacted by walking or tracking in with a heavy dozer or rubber-tired (pneumatic) equipment. Each lift shall be compacted by at least four passes with the equipment.

In areas of dense vegetation, the surface organic material shall be stripped from the ground within the roadway and cut and fill areas. Stripping to a maximum depth of 6″ will be adequate unless otherwise directed by the company or its representative. Stripped and disturbed areas shall be compacted as specified above or as shown in the drawings or access road charts.

Personnel constructing the access road system shall be aware of the definition of a wetland such that potential wetlands may be identified before work is begun. In some cases where wetlands have been identified, road construction personnel shall comply with requirements as directed by the company or its representative.

Ditches, installed culverts, and/or installed surface drains to drain wet areas resulting from springs, seeps, or poor surface drainage may be required to construct the road. Drainage ditches shall be shallow, not to exceed 18″ in depth. The ditch bottom shall have a width of approximately 1′ and side slopes shall not exceed 1.5 to 1 (see Figure 5).

All earthwork and grading, cut and fill slopes, and other disturbed areas shall be re-vegetated with seed. Unless otherwise specified, the seed mix shall consist of 45 percent rye grass, 45 percent orchard or fescue grass, and 10 percent clover. The seed shall be applied at a minimum of 60 pounds per acre. At locations where the ground slope is greater than 10 percent, the seeds shall be covered with straw- or wood-fiber mulch applied at a rate of one ton of mulch per acre. The seed shall be spread in early fall when weather permits.

All phases of operation, including the construction of truck and tractor roads, shall be conducted to minimize as much as practical the damage to the soil and to prevent gullies and creation of other conditions conducive to soil erosion. Repair of all erosion damage shall be accomplished as soon as it occurs to prevent further loss of material into existing drainages. Cut slopes shall be stabilized. Care shall be taken to avoid creation of wet land conditions.

Crew movement on the right-of-way, including access routes, shall be limited so as to minimize damage to land or property. Crews shall endeavor to avoid marring the lands. Ruts and scars shall be obliterated, damage to ditches, terraces, roads and other features of the land shall be corrected, and the disturbed land beyond the access roads and structure landings shall be restored, as nearly as practical, to its original condition before final acceptance of the work.

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Erosion control measures shall be installed to minimize the transport of eroded sediments to streams and other waterways. Erosion control measures may include, but are not necessarily limited to, straw bales and silt fences.

E. Road Cross Sections

This section provides road cross sections, including required dimensions, cleared right-of-way width, and other information. See general road construction notes in Section G and references in Section H.

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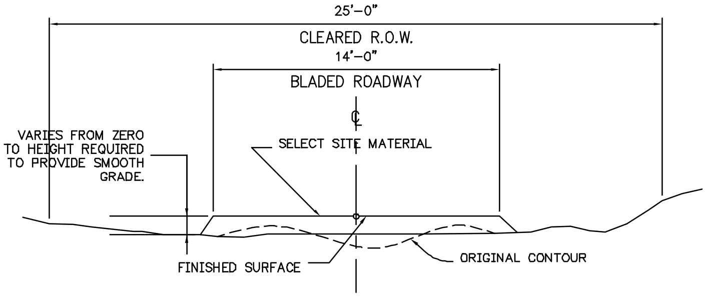
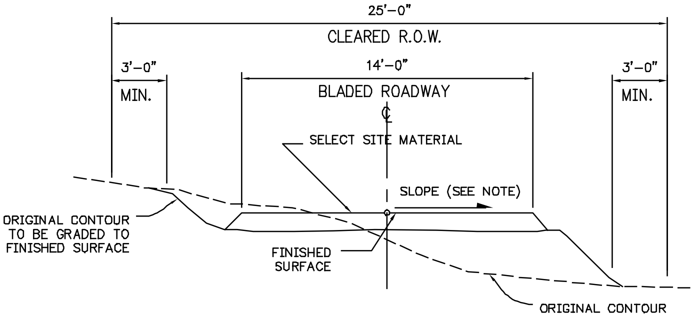
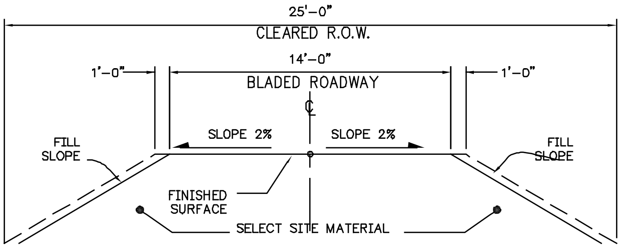


TYPICAL SECTION ON FLAT GROUND

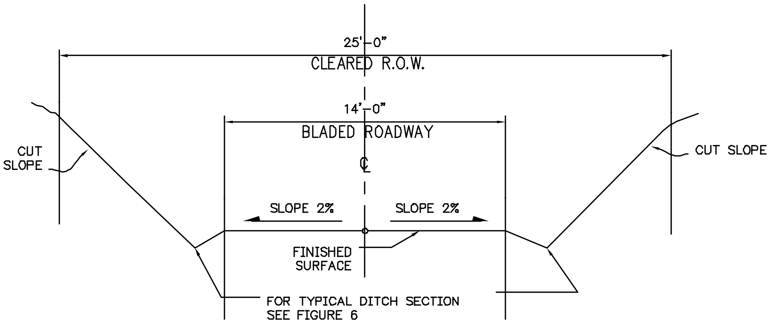


NOTE:
PROVIDE "OUTSLOPED" ROAD CROSS–SECTION, BY GRADING ROADS TO SLOPE IN THE SAME DIRECTION AS THE SURROUNDING TOPOGRAPHY. SO THAT THE UPHILL EDGE OF THE ROAD IS HIGHER THAN THE DOWNHILL EDGE. BESIDES ALLOWING RUNOFF TO EXIT THE ROADWAY IN AS SHORT A DISTANCE AS POSSIBLE. THIS ELIMINATES THE NEED FOR ROADSIDE DITCHES. PROVIDE A MINIMUM 2% OUTSLOPE ON ROADS WITH GRADES AS STEEP AS 15% ON STEEPER ROADS. PROVIDE 4% OUTSLOPE. AVOID OUTSLOPED ROADS WHERE THEY WOULD DIRECT RUNOFF ONTO ERODIBLE FILL, EMBANKMENTS OR WHERE THEY WOULD CAUSE OFF–CAMBER CURVES.

TYPICAL "OUTSLOPE" SECTION



TYPICAL FILL SECTION



TYPICAL THROUGH CUT SECTION

Figure 1—Typical Road Sections for Different Terrains

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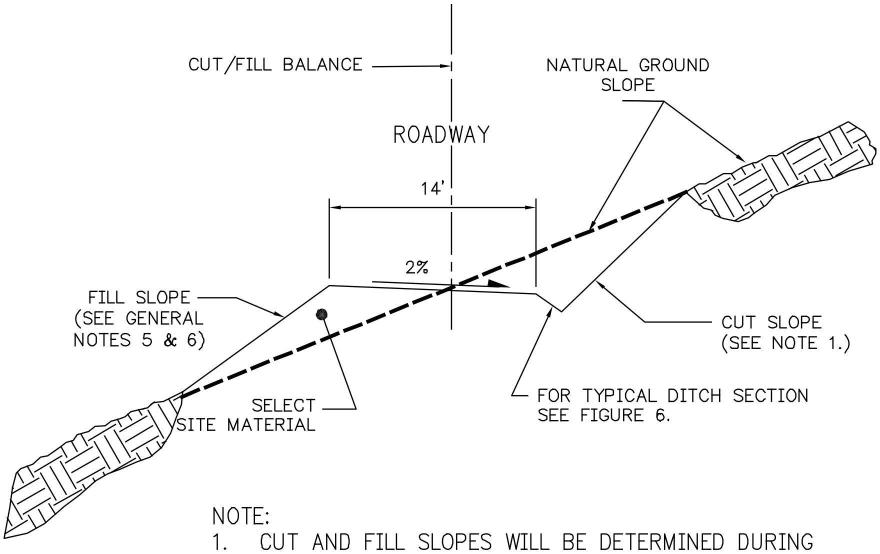
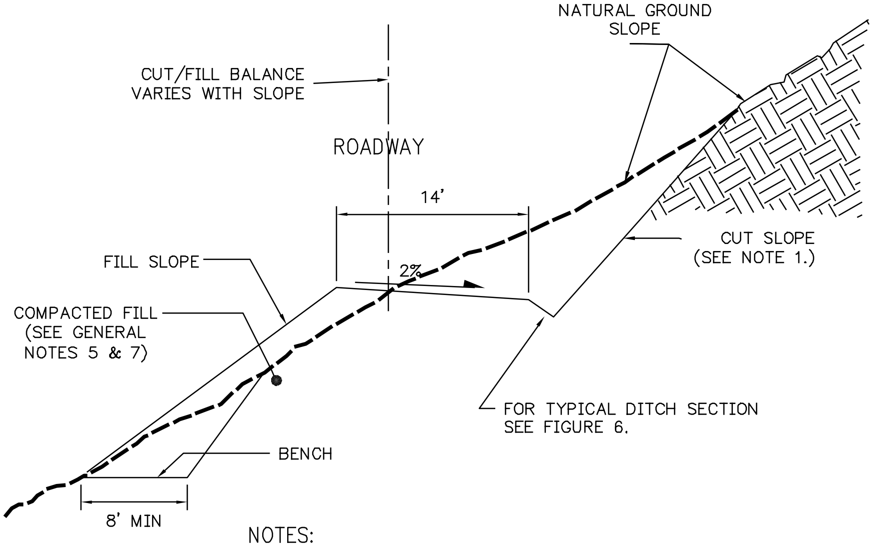


NOTE:
1. CUT AND FILL SLOPES WILL BE DETERMINED DURING CONSTRUCTION, BASED ON SITE CONDITIONS ENCOUNTERED AND AS APPROVED BY COMPANY.

Figure 2—Typical Cut and Fill Insloped Road Section for Natural Side Slopes Less Than 30 Percent (15°)


NATURAL GROUND SLOPE
CUT/FILL BALANCE VARIES WITH SLOPE
ROADWAY
14'
2%
FILL SLOPE
CUT SLOPE (SEE NOTE 1.)
COMPACTED FILL (SEE GENERAL NOTES 5 & 7)
FOR TYPICAL DITCH SECTION SEE FIGURE 6.
BENCH
8' MIN

NOTES:
1. CUT AND FILL SLOPES WILL BE DETERMINED DURING CONSTRUCTION, BASED ON SITE CONDITIONS ENCOUNTERED AND AS APPROVED BY COMPANY.

Figure 3—Typical Cut and Fill Insloped Road Section for Natural Side Slopes Greater Than 30 Percent (15°) and Less Than 60 Percent (30°)

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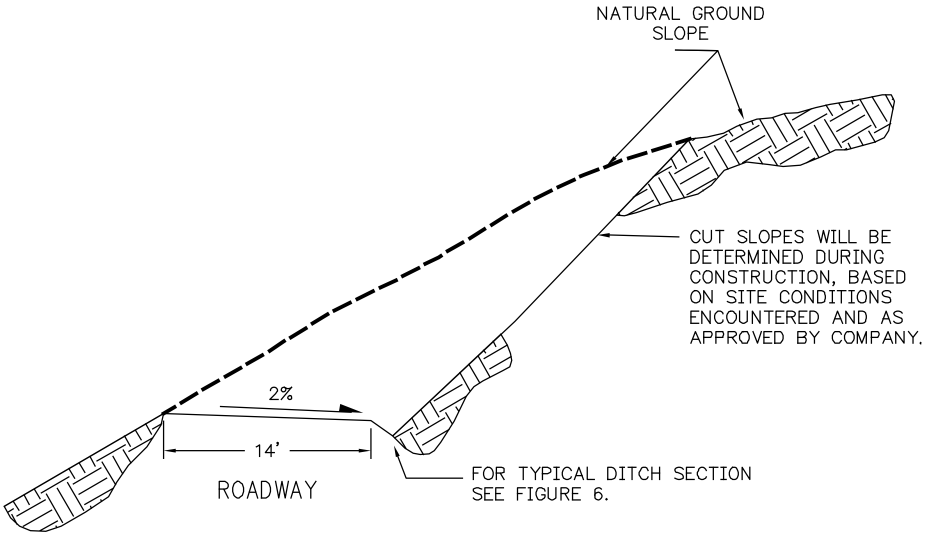
NATURAL GROUND SLOPE
CUT SLOPES WILL BE DETERMINED DURING CONSTRUCTION, BASED ON SITE CONDITIONS ENCOUNTERED AND AS APPROVED BY COMPANY.
2%
14'
ROADWAY
FOR TYPICAL DITCH SECTION SEE FIGURE 6.

Figure 4—Typical Cut and Fill Section
for Natural Side Slopes Greater than 60 Percent (30°)

F. Typical Ditch Section

Typical ditch construction is depicted in Figure 6. Many of the road cross sections shown above use this ditch construction.

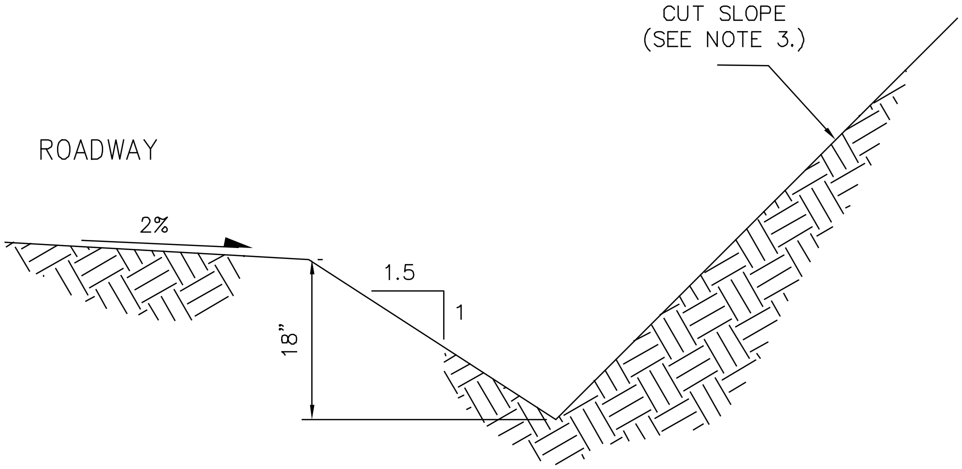

Figure 5—Ditch Section

Notes:

1. Slope the ditch so that it will drain; ditch shall have a minimum slope of 1 percent and not to exceed 3 percent.
2. Remove all soil, rock, and other material loosened by grading from ditch.
3. Cut slopes will be determined during construction based on site conditions and as approved by the company representative.

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G. General Road Construction Notes

1. Roads shall follow natural contours as much as practical.
2. Maximum grade for roads shall be 10 percent. Grades up to 20 percent will be allowed for a distance of 1000 feet where unavoidable and approved by the company.
3. Radius of curves shall be 200 feet, with a minimum of 80 feet when approved by company. When curves are less than 200 feet, roadbed shall be widened as shown in Table 2.
4. Cut and fill slopes will be determined during construction based on site conditions encountered and as approved by the company.
5. Unless specified otherwise by the company, fill material shall consist of site material excavated from RG-1 cuts. Fill material shall have a maximum particle size of 12″.
6. Fills placed on side slopes of 30 percent or less shall be placed in nominal 9″ lifts and compacted by walking in with at least four passes of earthwork equipment.
7. Fills placed on side slopes greater than 30 percent shall be placed in nominal 12″-thick lifts and compacted to at least 90 percent of the maximum dry density as determined by the ASTM D 696 method of compaction.
8. Allow 1′ additional road width on fill slopes for sloughing. When fills are over 6′ high at shoulder, allow 2′ additional road width.
9. Road construction across wetland areas may require placement of fragmented 6″ minus rock. Rock shall be placed in 8″-thick lifts and compacted by a heavy dozer or vibratory roller until well keyed. RB-(1) rock will be provided and installed by the contractor. Proper construction shall be use in wetlands so conditions as shown in Figure 7 do not develop.
10. Geotextile fabric material shall consist of MIRAF1212 OHP or equivalent, as approved by the company.

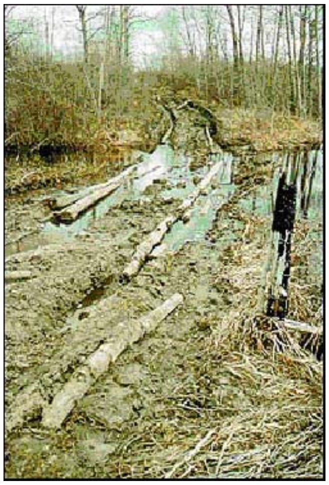

Figure 6—Poor Road Construction in Wetland Area

Table 2—Road Width for Different Road Curves

Curve Radius (feet)	Roadbed Width (feet)
200 or >	14
150 to 200	16
100 to 150	18
80 to 100	20

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H. References

1. *Handbook for Forest and Ranch Roads*, William E. Weaver, PHD. and Danny K. Hagans, 1994.
2. *A Landowner's Guide to Building Forest Access Roads,* United States Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry, July 1998.

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Engineer (C. Wright): CLW
Standards Manager (G. Lyons): GL

Roads—Water Bars and Water Dips

A. Scope

This standard describes drainage methods, including water bars, water dips, ditches, and outsloping, which can be used where intermittent or permanent streams cross roadways. Depending on the method used, drainage structures should be installed during or after basic road construction (see TA 501, *Roads—Construction*). For information on ditches and culverts see TA 504, *Roads—Culvert Installation*.

On level terrain, road construction may only require back-dragging a blade to remove brush to facilitate construction. Water bars and dips may not be necessary.

In undulating or mountainous terrain, water bars or water dips shall be used to control erosion.

The BLM or US Forest Service may require special designs for road design.

On privately owned land, both PacifiCorp and the property owner shall approve a plan to best control erosion on rights-of-way roads.

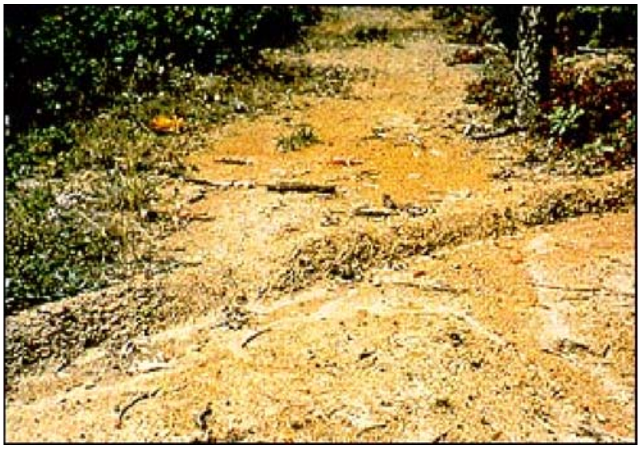


Figure 1—A water bar effectively intercepts the surface water and diverts it from the road

B. Water Bars

Water bars are narrow structures which can be constructed at various depths. Deep bars are generally used on roads closed to vehicle traffic. Figure 1 shows a typical shallow water bar constructed across a road.

Water bars can be constructed with hand tools, but bulldozers are most commonly used. It is best to start at the end of the road and work outward so the bars are not damaged with frequent crossing by heavy machinery.

Table 1—Distance Required Between Water Bars

Road grade (%)	Distance (feet)
2	250
5	135
10	80
15	60
20	45
25	40
30	35

Source: Kochenderfer 1970, p. 28

Water bars should be installed at an approximate 30° angle downslope. Figure 2 shows dimensions for construction of water bars and water dips with and without drainage

Deviation from this standard requires advanced approval. Contact the standards engineering manager for approval process and forms.

ditches to be used on access and right-of-way roads. The outflow end of the water bar should prevent water from accumulating and should not flow directly into a stream. This will allow sediment to settle out of the water, preventing erosion. As a supplement to water bars on closed roads, logging slash can be lopped and scattered, grass can be planted, or both. Table 1 shows recommended spacing between water bars for various road grades.

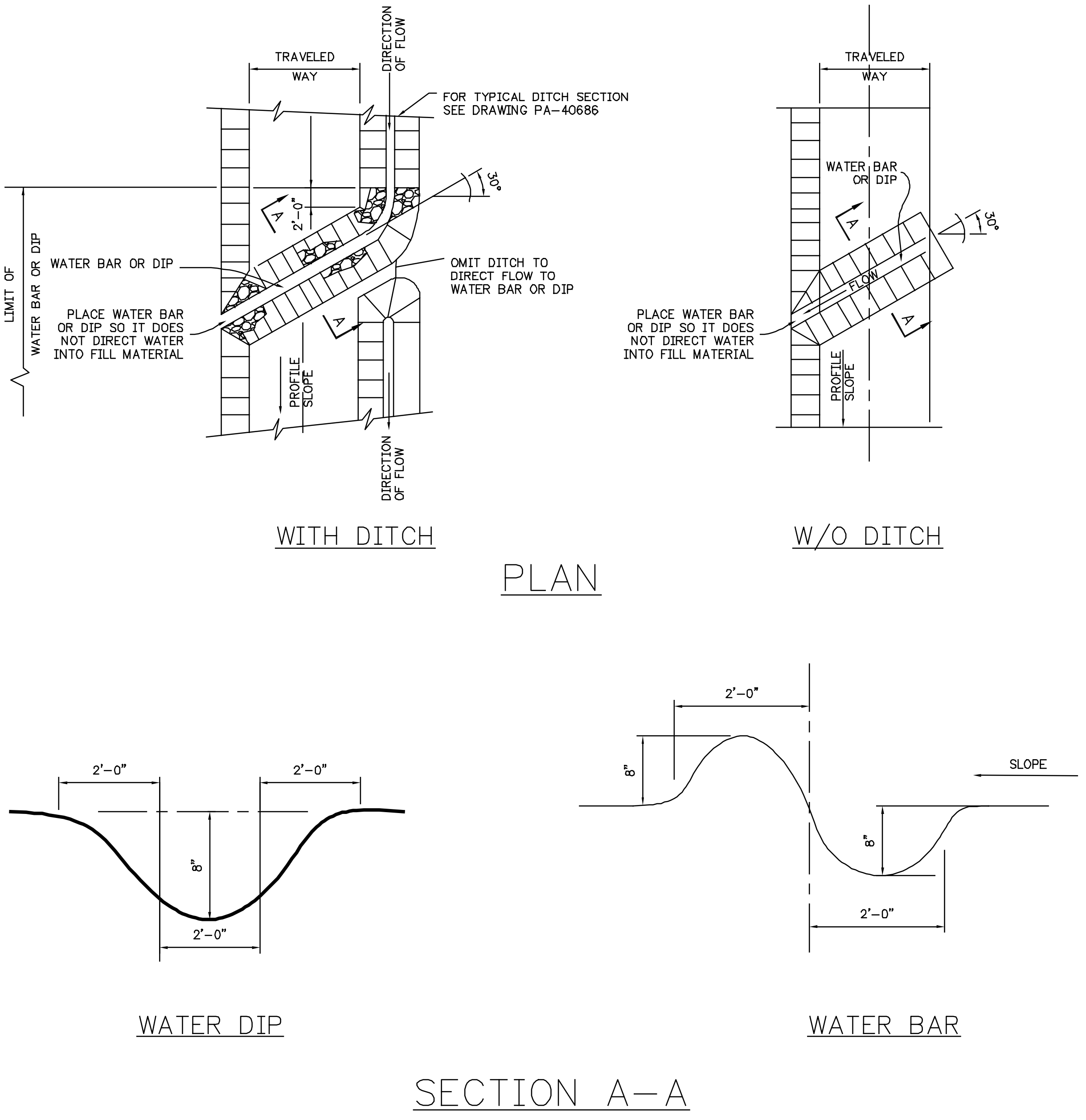
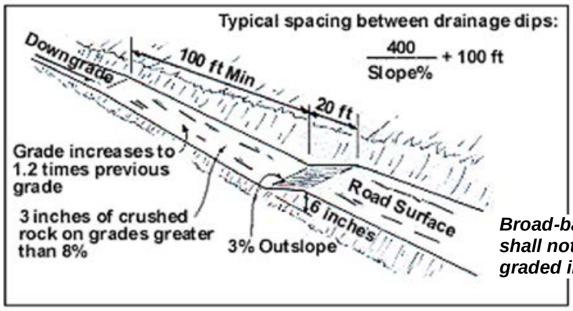

TRAVELED WAY
DIRECTION OF FLOW
FOR TYPICAL DITCH SECTION SEE DRAWING PA-40686
30°
2'-0"
A
LIMIT OF WATER BAR OR DIP
WATER BAR OR DIP
PLACE WATER BAR OR DIP SO IT DOES NOT DIRECT WATER INTO FILL MATERIAL
OMIT DITCH TO DIRECT FLOW TO WATER BAR OR DIP
PROFILE SLOPE
DIRECTION OF FLOW
WITH DITCH
TRAVELED WAY
WATER BAR OR DIP
30°
A
FLOW
PLACE WATER BAR OR DIP SO IT DOES NOT DIRECT WATER INTO FILL MATERIAL
PROFILE SLOPE
W/O DITCH
PLAN
2'-0"
2'-0"
8"
2'-0"
WATER DIP
2'-0"
8"
SLOPE
8"
2'-0"
WATER BAR
SECTION A-A

Figure 2—Water Bar and Dip Construction Plan and Profile

C. Broad-Based Drainage Dips

Broad-based drainage dips are easily maintained and do not increase wear on vehicles or reduce hauling speed when properly installed. These dips shall not be used on roads graded in excess of 10 percent (see Figure 3).

Table 2 lists the spacing distances of broad-based dips, as computed with the formula shown in Figure 3.


Typical spacing between drainage dips:
400 / Slope% + 100 ft
Downgrade
100 ft Min
20 ft
Grade increases to 1.2 times previous grade
3 inches of crushed rock on grades greater than 8%
3% Outslope
16 inches
Road Surface

Broad-based drainage dips shall not be used on roads graded in excess of 10%.

Figure 3—Typical Spacing Between Drainage Dips

Table 2—Minimum Distance Needed Between Drainage Dips

Road grade (%)	Distance (feet)
2 – 4	300 – 200
5 – 7	180 – 160
8 – 10	150 – 140

Source: Kochenderfer 1970, pg.19, 25

As with a water bar, care shall be taken to ensure adequate drainage at the outflow of a dip. Broad-based drainage dips shall never be designed to discharge directly into a stream. The discharge area shall be protected with stone, grass, sod, heavy litter cover, brush, logs, or other natural material which will reduce the velocity of the water. Natural litter may be adequate in many cases if the terrain is not too steep.

Close attention shall be paid to construction of broad-based drainage dips, as they are often made too small. Figure 3 shows minimum dimensions. Dips shall be armored with crushed rock or gravel.

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Deviation from this standard requires advanced approval. Contact the standards engineering manager for approval process and forms.

Figure 4 shows a practical example of how a broad-based drainage dip can be used. A drainage dip is effective in controlling water on the road and does not significantly slow the speed of vehicles. The local drainage shall dictate how often these dips shall be used.

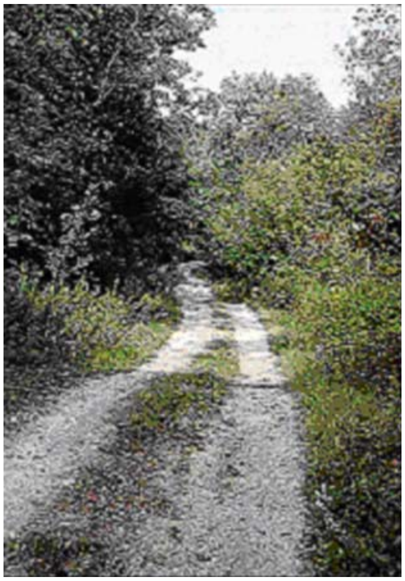

Figure 4—Broad–Based Drainage Dip

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Roads—Culvert Installation

A. Scope

This standard provides information about the construction of surface drainage and the installation of culverts. It is impossible to over-emphasize the importance of drainage in maintaining stable roads and protecting water quality. Roads should be designed and constructed to cause minimal disruption of natural drainage patterns. Provisions for two components of road drainage should be included in every road project: 1) road-surface drainage (including drainage which *originates* from the cutbank, road surface, and fill-slope), and 2) hill-slope drainage (including drainage from large springs, gullies, and streams which *cross* the road alignment).

B. Determining Culvert Diameter

Use pipe no smaller than 24″ in diameter. A drainage table provides help in determining the proper size culvert (see Table 1 and Table 2). The following example illustrates how to choose pipe size (Table 1) using the drainage table (Table 2). To use this method, you will need information on slope, soils, and cover.

Example: The area to be drained is 70 acres on steep slopes with heavy soils and moderate cover. In Table 2 under C opposite 70, find area required: 10.3 square feet. Under the area table for round pipe (Table 1), the pipe size should fall between 42″ and 48″. Use 42″ pipe with an area of 9.6 square feet. If a wood or other type of box culvert is planned, one 3′ by 3.5′ pipe would furnish the required area.

Table 1—Size of Round Pipe Needed for Area of Waterway

Area (square feet)	**Pipe diameter (inches)**
1.25	24
1.80	24
3.10	24
4.90	30
7.10	36
9.60	42
12.60	48
15.90	54
19.60	60
23.80	66
28.30	72
33.20	78
38.50	84
44.20	90

Source: Figure 45, Haussman and Pruett 1978, p. 36

Table 2—Drainage Table Based on Talbot’s Formula for Rainfall 1-1/4″ per Hour

	Area required for waterway							
Acres	**Impervious 100% runoff**	**Steep slopes Heavy soils Moderate cover**		**Moderate slopes Heavy to light soils Dense cover**		**Gentle slopes Agricultural soil & cover**		**Flatland Previous soils**
	†C=1.00	C=0.80	C=0.70	C=0.60	C=0.50	C=0.40	C=0.30	C=0.20
	Square Feet							
2	0.5	0.4	0.4	0.3				
4	0.9	0.7	0.6	0.5				
6	1.2	1.0	0.8	0.7	0.6	0.5		
8	1.5	1.2	1.0	0.9	0.7	0.6		
10	1.7	1.4	1.2	1.0	0.9	0.7	0.3	
20	2.9	2.3	2.0	1.8	1.5	1.2	0.5	
30	4.0	3.2	2.7	2.4	2.0	1.6	0.5	0.3
40	4.9	3.9	3.4	3.0	2.5	2.0	0.9	0.4
50	5.8	4.7	4.0	3.5	2.9	2.3	1.2	0.6
60	6.7	5.4	4.6	4.0	3.4	2.7	1.5	0.8
70	7.5	6.0	5.2	4.5	3.8	3.0	1.8	1.0
80	8.3	6.7	5.8	5.0	4.2	3.3	2.0	1.2
90	9.1	7.3	6.3	5.5	4.6	3.6	2.3	1.4
100	9.9	7.9	6.8	5.9	4.9	3.9	2.5	1.5
150	13.5	10.6	9.3	8.0	6.7	5.4	2.7	1.7
200	16.6	13.4	11.5	10.0	8.4	6.7	2.9	1.8
250	19.8	15.8	13.6	11.9	9.9	7.9	4.0	2.0
300	22.9	18.1	15.5	13.6	13.5	9.0	5.0	2.7
350	25.5	20.3	17.5	15.3	12.7	10.1	5.9	3.3
400	28.0	22.5	19.5	17.0	14.0	11.1	6.8	4.0
450	30.9	24.9	21.0	18.5	15.3	12.1	7.5	5.1
500	33.4	26.4	23.0	20.0	16.6	13.3	8.4	5.6
600	38.5	30.8	26.3	23.0	19.0	15.2	9.0	6.2
700	43.0	34.2	29.8	26.0	21.5	17.0	9.9	6.6
800	48.0	38.1	32.9	28.5	23.8	19.0	11.4	7.7
900	52.0	41.5	35.9	31.1	26.0	20.8	12.9	8.6
1000	56.5	45.0	38.9	34.0	28.3	22.5	14.3	9.5

* See Table 1 for size of pipe needed.

† C is the constant factor based on a combination of how much water the soil can hold, slope, and cover. C = .70 is adequate for most conditions prevailing in the Northeast. C = 1.00 represents complete runoff of precipitation (e.g., rock surfaces).

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Table 3 provides a simplified method for determining culvert size. To use this table, determine the size of the drainage area (in acres) above the stream crossing as well as the expected life of the culvert. A private consultant may provide assistance determining the size of a culvert. Make sure they do not size the culverts for a 50- or 100-year storm, unless that is what is required. For low-traffic or temporary roads, a flood frequency of 20 years can be used.

Table 3—Culvert Sizes by Drainage Area

	Recurrence interval (years)		
	10	20	50
Area (acres)	**Culvert diameter (inches)**		
10	24	24	18
20	24	24	20
30	24	24	24
40	24	24	26
50	24	24	28
60	24	24	28
70	24	26	30
80	24	26	30
90	24	28	32
100	26	28	34
125	28	30	36
150	28	32	38
175	30	34	40
200	32	36	42

Source: Table 3, Helvey and Kochenderfer 1988, p. 125

C. Determining Culvert Lengths

The following simplified procedure can be used to determine culvert lengths needed for new stream crossings or ditch-relief drains. Refer to Figure 1 for specific locations and distances described in the step-by-step procedure. A complete example follows these instructions.

1. Estimate the depth of the fill (F) at the running surface on the inside of the road above the culvert inlet (point “a”).
2. Additional width (C) due to fill is then estimated as 1.5 times the fill depth (F) (that is, all fill slopes are assumed to be 1.5:1 in steepness).
3. Add half the road width (1/2 W) and the fill width (C). Measure this distance horizontally upstream from the center line of the road, and place stake at location A. The horizontal

distance must be converted to slope distance before you can tape it off on the ground. Use Table 4 to convert horizontal distance to slope distance (on-the-ground distance).

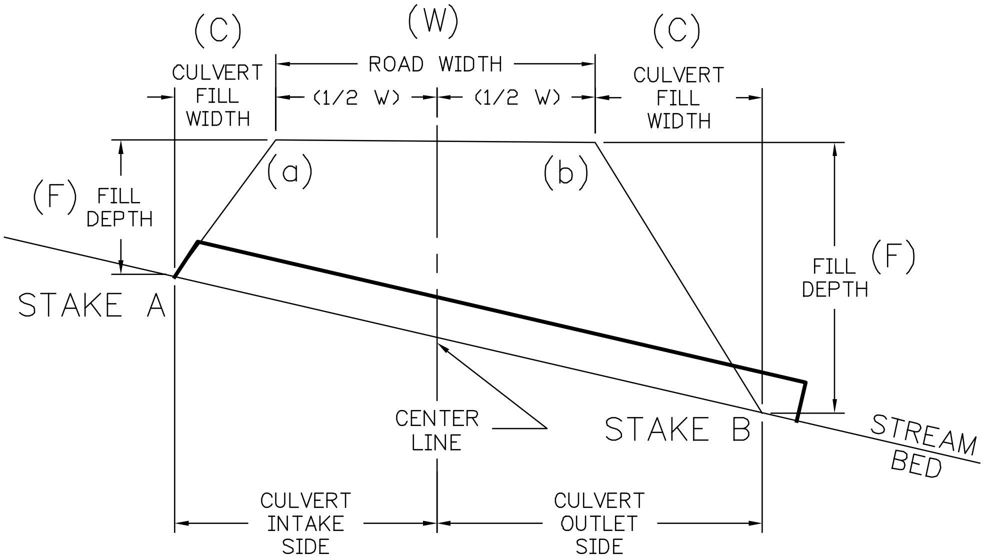

Figure 1—Culvert Length

4. Repeat steps 1 through 3 for the culvert outlet side of the crossing and place stake at location B.
5. Measure the slope length between stakes A and B. This measurement, plus two to four extra feet, is the length of culvert needed for the installation. The extra several feet are added to extend the inlet and outlet beyond the edge of the fill.

   Forty-four feet horizontal distance equals 52.4 feet slope distance on a 65 percent slope.

   horizontal distance × correction factor = slope distance

   (44ft) × (1.19) = 52.4′

Example: What culvert length is needed for a 14′ wide road crossing a stream with a 55 percent gradient? The estimated inside fill-depth, above the culvert inlet, will be 6′ and the fill-depth above the outlet will be 13′.

Step 1: Estimated depth of fill (F) at culvert inlet = 6′

Step 2: (C) = 1.5 × 6′ = 9′

Step 3: 14′ wide road (W), so 1/2 × 14′ = 7′

Stake A (the location of the culvert inlet) should be placed on the ground a distance of (9′ + 7′) = 16 horizontal feet up the stream channel from the flagged centerline of the road. According to the correction table, 16 feet horizontally on a 55 percent slope is 18.2′ slope distance (16′ × 1.14 = 18.2′).

Place the inlet stake (A) 18.2′ up the channel from the centerline of the road.

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Step 4: Estimated depth of fill (F) at culvert outlet =13′

Step 5: (C) = 1.5 × 13′ = 20′

Step 6: 14′ wide road (W), so 1/2 × 14 = 7′

Stake B (the location of the culvert outlet) should be placed on the ground a distance of (13′ + 20′) = 33 horizontal feet down the stream channel from the flagged centerline of the road. According to the correction table, 33 feet horizontally on a 55 percent slope is 37.6′ slope distance (33′ × 1.14 = 37.6′0.

Place the outlet stake (B) 37.6′ down the channel from the centerline of the road.

Step 7: Length of culvert needed = 18.2′ + 37.6′ = 55.8′ or about 56′.

Approximately 2′–4′ should be added to this length to make sure the culvert inlet and outlet extend sufficiently beyond the base of the fill.

Final culvert length to be ordered and delivered to the site = 56′ + 4′ = 60′.

Table 4—Slope Correction Factors to (C) on Vertical-Horizontal Distance to Slope Distance

Hill slope or stream channel gradient (%)	Correction factor (multiplier)	Hill slope or stream channel gradient (%)	Correction factor (multiplier)
10	1.00[1]	45	1.10
15	1.01	50	1.12
20	1.02	55	1.14
25	1.03	60	1.17
30	1.04	65	1.19
35	1.06	70	1.22
40	1.08	75	1.25

[1] For a slope of 10 percent or less, no correction factor is needed.

D. Culvert Installation for Ditch Relief

Insloped roads should be constructed: 1) where road-surface drainage discharged over the fillslope would cause unacceptable erosion or discharge directly into stream channels, 2) where fillslopes are unstable, or 3) where outsloping would create unsafe conditions for use. It is generally preferable to outslope road surfaces in order to disperse road-surface runoff before it has a chance to concentrate.

Insloped roads should be built with an inside drainage ditch to collect and remove road surface runoff (TA 501, *Roads—Construction*). Roads steeper than about 8 percent may be too steep for an inside ditch because of the potential for gullying in the ditch. Inside ditches should also be drained at intervals sufficient to prevent ditch erosion or

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outlet gullying, and at locations where water and sediment can be filtered before entering a watercourse. Filtering can be accomplished with thick vegetation, gentle slopes, settling basins, or filter windrows of woody debris and mulches secured to the slope.

As with outsloped roads, steep insloped road surfaces may be difficult to drain. Rolling dips (for permanent, surfaced roads and seasonal roads) or waterbars (for seasonal or temporary, unsurfaced roads) should be constructed at intervals sufficient to disperse road surface runoff from steep road segments. See TA 503, *Roads—Water Bars and Water Dips* for more information.

Ditches and culverts need occasional maintenance to maintain proper flow. Annual and storm-period inspection can prevent small problems from growing into large failures. When ditches become blocked by cutbank slumps, they need to be cleaned and the spoil deposited in a stable location. However, excessive maintenance (i.e., grading) can cause continuing and persistent erosion, sediment transport, and sediment pollution to local streams. It may also remove rock surfacing.

Ditch relief culverts should be designed and installed along the road at intervals close enough to prevent erosion of the ditch and at the culvert outfall, and at locations where collected water and sediment is not discharged directly into watercourses (Table 5).

Table 5—Maximum Suggested Spacing for Ditch Relief Culverts (ft)

Road grade			**Soil Credibility**		
(%)	**Very High**	**High**	**Moderate**	**Slight**	**Very Low**
2	600-800				
4	530	600-800			
6	355	585	600-800		
8	265	425	525	600-800	
10	160	340	420	555	
12	180	285	350	460	600-800
14	155	245	300	365	560
16	135	215	270	345	490
18	118	190	240	310	435

On new roads, ditch flow should be directed into a culvert and discharged into buffer areas and filter strips before it reaches a watercourse crossing. Ditches should neither be discharged directly into the inlet of a watercourse crossing culvert, nor should ditch relief culverts discharge into a watercourse without first directing flow through an adequate filter strip. In addition to installing ditch relief culverts on either approach to watercourse crossings, it is advisable to consider installing ditch drains before curves, above and below through-cut road sections, and before and after steep sections of the road.

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Engineer (C. Wright): CLW
Standards Manager (G. Lyons): GL

If a ditch is capable of transporting and delivering sediment to a Class I or Class II watercourse during a flood event, it can be said to function the same as a Class III watercourse. It has a bed and a bank, and it can transport sediment. Ditches which drain directly into watercourse-crossing culverts should be treated and protected from disturbance and erosion, just as is a Class III watercourse. Ditch relief culverts should be installed across ditched roads before water course crossings so that water and sediment can be filtered before reaching the stream.

Ditch relief culverts do not need to be large, since they carry flow only from the cutbank, springs, and a limited length of road surface. In areas of high erosion and/or storm runoff, nominal ditch relief culvert sizes should be 18″, but ditch relief culverts should never be less than 15″ diameter. Smaller culverts are too easily blocked (Figure 2). Generally, culverts should have a grade at least 2 percent greater than the ditch which feeds it to prevent sediment buildup and blockage. Where possible, ditch relief culverts should be installed at the gradient of the original ground slope, so it will emerge on the ground surface beyond the base of the fill. If this is not possible, the fill below the culvert outlet should be armored with rock or the culvert fitted with an anchored downspout to carry erosive flow past the base of the fill. Culverts should never be "shot-gunned" out of the fill, thereby creating highly erosive road drainage waterfalls (Figure 3).

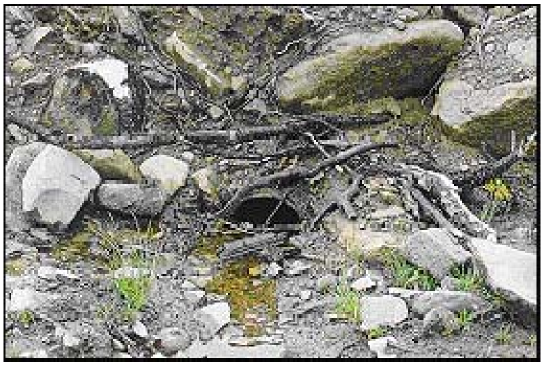

Figure 2—Undersized Culvert

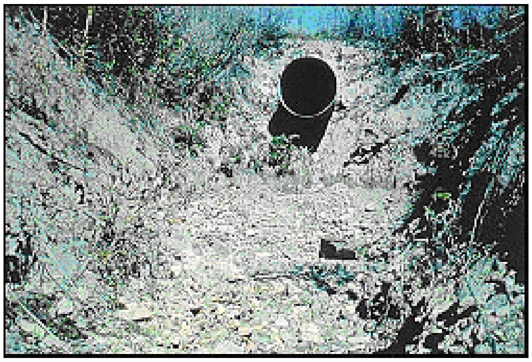

Figure 3—Culvert Not Installed at the Existing Stream Gradient

A 10 percent grade to the culvert will usually be self-cleaning. The culvert should be placed at a 30° angle to the ditch to improve inlet efficiency and prevent plugging and erosion at the inlet. The pipe should be covered by a minimum of 18″ of compacted soil, or to a depth of 1.5 times the culvert diameter, whichever is greater. Finally, inlet protection such as rock armoring or drop structures can be used to help minimize erosion, slow flow velocity, and settle sediment before it is discharged through the pipe.

E. Culvert Installation for Stream Crossings

The importance of proper planning for stream crossings cannot be overstated. If stream crossings are not planned and located before road construction begins, serious problems may arise, including unintended damage to natural resources. Requirements for stream crossings vary from state to state. Often, a permit is required; check with the water division of the local natural resources agency.

Culverts can be considered dams that are designed to fail. The risk of culvert failure is substantial for most crossings, so *how* they fail is critical. In the upper sketch in

Figure 4, the crossing has failed and the road grade has diverted the stream down the road, resulting in severe erosion and downstream sedimentation. Such damage to aquatic habitats can persist for many years. Stream diversions are easy to prevent, as illustrated by the lower sketch, in which the road grade was such that a failed crossing caused only some loss of road fill.

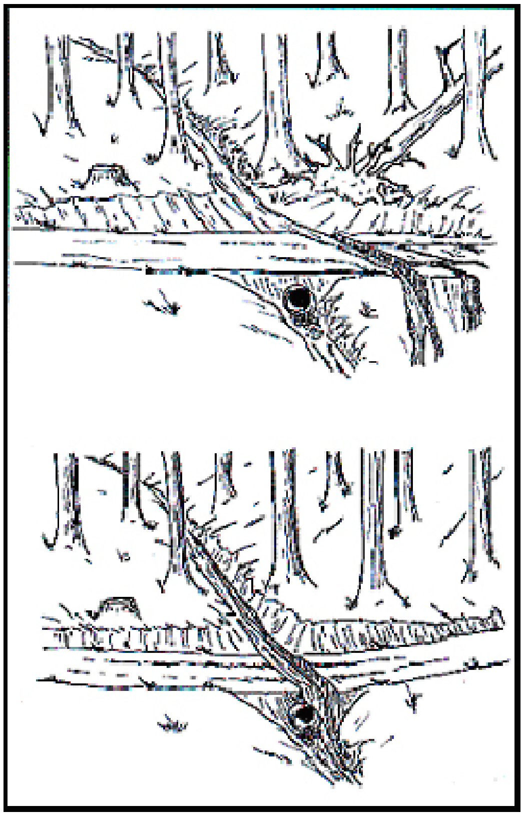

Figure 4—Stream Crossing Failures

Culverts should be installed as road work progresses. The culvert and its related drainage features should be installed via the following steps:

1. Place debris and slash to be used as a filter system, if needed.
2. Construct sediment ponds, if needed.
3. Complete downstream work first, such as energy dissipating devices and large rock riprap.
4. Route stream around work area until pipe is installed.
5. Construct pipe inlet structure.
6. Install culvert pipe.

A culvert inlet should be placed on the same level as the stream bottom. Where the culvert inlet has to be lower than the drainage gradient, a drop box can be constructed. The box provides a place for sediment to settle before water enters the culvert. Drop boxes require frequent maintenance.

Install culvert pipes as near as possible to the gradient of the natural channel and so there is no change in the stream bottom elevation (Figure 5). Culverts should not cause damming or pooling. Seat the culvert on firm ground and compact the earth at least halfway up the side of the pipe to prevent water from leaking. Pipe culverts must be adequately covered with fill; the rule is a minimum of 30″ or 1.5 times the culvert diameter, whichever is greater.

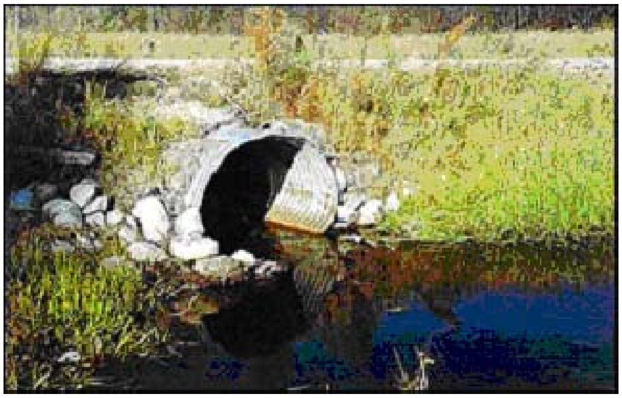
Figure 5—Culvert Installed at Channel Gradient

If adequate cover cannot be achieved, an arch pipe or two small culverts should be installed. The cover must also be compacted to prevent settling in the road. Debris-laden material should not be used to cover pipe culverts.

The following are additional guidelines for installing culverts in streams:

- Limit construction activity in the water to periods of low or normal flow.
- Minimize use of equipment in streams.
- Use soil stabilization practices on exposed soil at stream crossings. Seed/mulch and install temporary sediment control structures, such as silt fences made of straw bales or geotextiles, immediately after road construction. Maintain these practices until the soil is permanently stabilized.
- Use materials that are clean, non-toxic, and which do not erode.

To prevent erosion and under-cutting of the inlet end of the culvert, provide a headwall. Sandbags containing some cement mixed with the sand, durable logs, concrete, or hand-placed riprap are suitable.

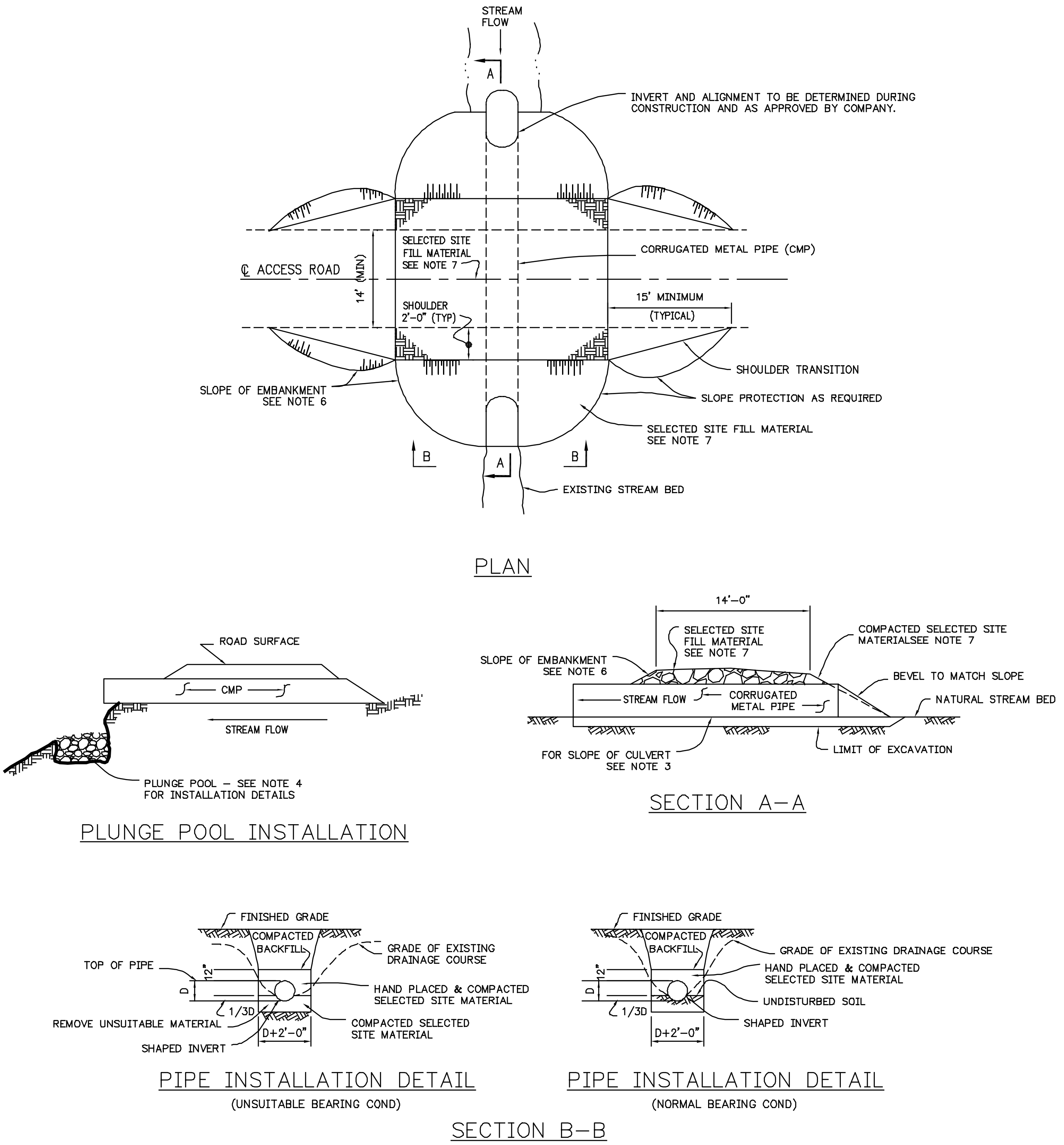
STREAM FLOW
A
INVERT AND ALIGNMENT TO BE DETERMINED DURING CONSTRUCTION AND AS APPROVED BY COMPANY.
SELECTED SITE FILL MATERIAL SEE NOTE 7
CORRUGATED METAL PIPE (CMP)
℄ ACCESS ROAD
14' (MIN)
SHOULDER 2'-0" (TYP)
15' MINIMUM (TYPICAL)
SHOULDER TRANSITION
SLOPE OF EMBANKMENT SEE NOTE 6
SLOPE PROTECTION AS REQUIRED
SELECTED SITE FILL MATERIAL SEE NOTE 7
B
A
B
EXISTING STREAM BED
PLAN
ROAD SURFACE
CMP
STREAM FLOW
PLUNGE POOL – SEE NOTE 4 FOR INSTALLATION DETAILS
PLUNGE POOL INSTALLATION
14'-0"
SELECTED SITE FILL MATERIAL SEE NOTE 7
COMPACTED SELECTED SITE MATERIALSEE NOTE 7
SLOPE OF EMBANKMENT SEE NOTE 6
BEVEL TO MATCH SLOPE
STREAM FLOW
CORRUGATED METAL PIPE
NATURAL STREAM BED
FOR SLOPE OF CULVERT SEE NOTE 3
LIMIT OF EXCAVATION
SECTION A–A
FINISHED GRADE
COMPACTED BACKFILL
GRADE OF EXISTING DRAINAGE COURSE
TOP OF PIPE
12"
D
HAND PLACED & COMPACTED SELECTED SITE MATERIAL
1/3D
REMOVE UNSUITABLE MATERIAL
D+2'-0"
COMPACTED SELECTED SITE MATERIAL
SHAPED INVERT
PIPE INSTALLATION DETAIL
(UNSUITABLE BEARING COND)
FINISHED GRADE
COMPACTED BACKFILL
GRADE OF EXISTING DRAINAGE COURSE
12"
D
HAND PLACED & COMPACTED SELECTED SITE MATERIAL
UNDISTURBED SOIL
1/3D
SHAPED INVERT
D+2'-0"
PIPE INSTALLATION DETAIL
(NORMAL BEARING COND)
SECTION B–B

Figure 6—Stream Crossing Culverts

Installation Notes for Figure 6:

1. Culverts for existing drainage shall be aligned with the drainage.

2. Culverts for roadway and ditch drainage shall be oriented at an angle of 30° to 45° to the roadway. See TA 503, *Roads—Water Bars and Water Dips*, for installation instructions.
3. Culverts shall be sloped a minimum of 1 percent or at least 1 percent steeper than the existing drainage.
4. When the culvert outlet is above grade, a plunge pool shall be constructed with length and width equal to two pipe diameters and a depth of one pipe diameter. Line plunge pool with geotextile fabric filled with 2″ to 8″ rock.
5. Culvert clogging debris located within 50′ of a culvert inlet shall be removed.
6. Cut and fill slopes will be determined during construction based on site conditions and as approved by the company.
7. See TA 501, *Roads—Construction*, for general road construction information.
8. Cover over culverts shall be 18″ or 1.5 times the culvert diameter, whichever is greater. To minimize damage from culvert failure, height of fill over culverts shall be as close to minimum as practical.
9. Outlets on culverts with pipe slopes greater than 3 percent shall be protected with a 30′ × 10′ strip of geotextile fabric fastened to culvert as a bib. Fabric shall be weighted down with 6″to 8″ rock to slow runoff.
10. Bottom of culvert shall be cushioned with fine-grain site material when installed over large rocks.

F. Fords

A ford is an alternative way to cross a water course where the streambed has a firm rock or coarse gravel bottom; the approaches are low and stable enough to support traffic; the stream is small to medium-sized, with water depth less than three feet and stream flows not exceeding 6 fps; and vehicle traffic is light. Dry fords can often be installed and used with minimal impact to the channel system.

The following standards apply when constructing a ford:

1. Install wing ditches, water-bars, dips, and level spreaders before the crossing. These structures should disperse runoff into an established and stable stream buffer.
2. If corduroy, coarse gravel, or gabion is used to create a driving surface, it should be installed flush with the streambed to minimize erosion and to allow fish passage.
3. Crossings should be at right angles to the stream.
4. Stabilize the approaches by using non-erodible material. The material should extend at least 50 feet on both sides of the crossing.
5. Requirements for stream crossings vary from state to state. Often a permit is required; check with the water division of the local natural resources agency.
6. Fords shall be designed for a low-maintenance long-term life. Rock size and grading, depth of rock, fabric underlayment, etc. and approaches shall be designed for the equipment expected to use the road.

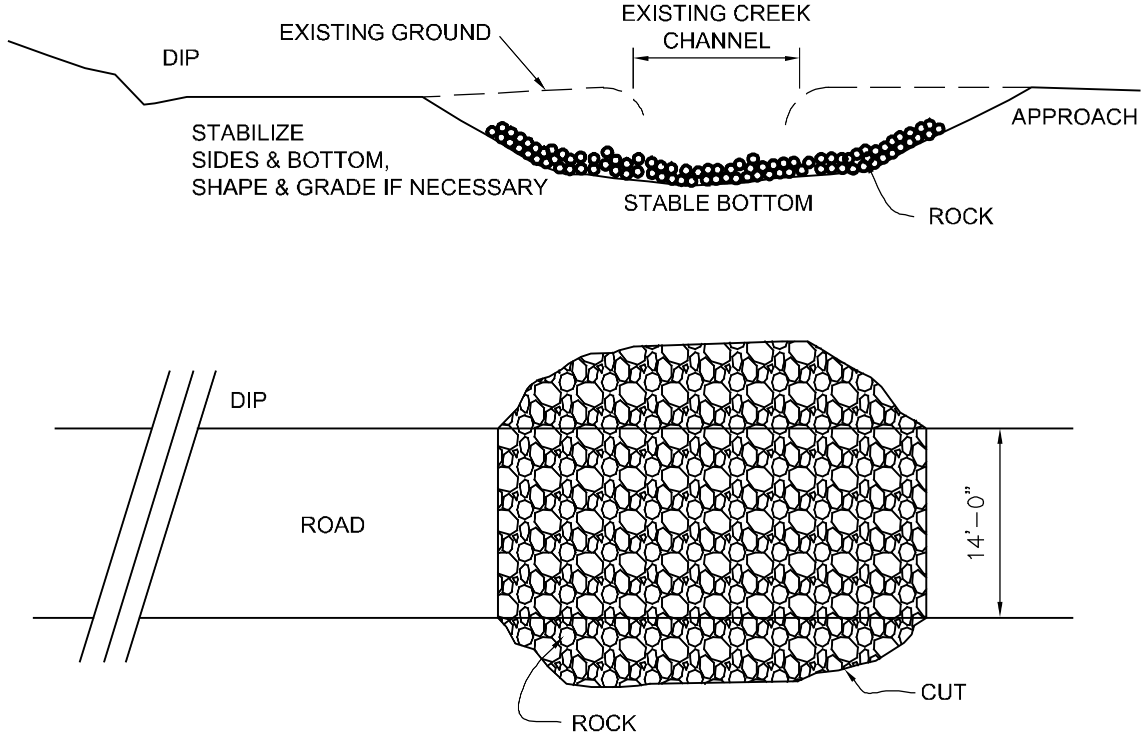

Figure 7 – Ford Stream Crossing

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Appendix C
Agency and Stakeholder Meetings

APPENDIX C – AGENCY AND STAKEHOLDER MEETINGS

C.1 Introduction

Appendix C contains a table (Table C-1) listing agency and stakeholder meetings and two tables (Tables C-2 and C-3) of public outreach initiated by the Applicant (PacifiCorp, doing business as Rocky Mountain Power).

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
Bureau of Land Management and U.S. Forest Service		
February 23, 2009	▪ Bureau of Land Management (BLM) Wyoming State Office ▪ BLM Las Vegas Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the environmental impact statement (EIS); and discuss preliminary alternative routes.
February 24, 2009	▪ BLM Wyoming State Office ▪ BLM Ely District Office ▪ BLM Caliente Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM district and field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
February 25, 2009	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Color Country District ▪ BLM Cedar City Field Office ▪ BLM Kanab Field Office ▪ BLM Richfield Field Office ▪ BLM St. George Field Office ▪ Dixie National Forest ▪ Rocky Mountain Power	Introduce and establish working relationships between BLM project management and BLM district and field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 11, 2009	▪ BLM Wyoming State Office ▪ BLM Grand Junction Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
March 12, 2009	▪ BLM Wyoming State Office ▪ BLM Moab Field Office ▪ Manti-La Sal National Forest ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management, BLM field office staff, and national forest; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 13, 2009	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ Ashley National Forest ▪ Manti-La Sal National Forest ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management, BLM field office staff, and U.S. Forest Service (USFS) staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 17, 2009	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 18, 2009	▪ BLM Wyoming State Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
March 19, 2009	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Salt Lake Field Office ▪ USFS Intermountain Region ▪ Fishlake National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Utah Governor's Energy Advisor's Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management, BLM field office staff, and USFS staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
July 30, 2009	▪ BLM Wyoming State Office ▪ BLM Las Vegas Field Office ▪ BLM St. George Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and BLM field office staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
August 25, 2009	▪ BLM Wyoming State Office ▪ Ashley National Forest ▪ Manti-La Sal National Forest ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management and USFS staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
August 27, 2009	▪ BLM Wyoming State Office ▪ Dixie National Forest ▪ Fishlake National Forest	Introduce and establish working relationships among BLM project management and USFS staff; identify BLM resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
August 28, 2009	▪ BLM Wyoming State Office ▪ Uinta-Wasatch-Cache National Forest	Introduce and establish working relationships among BLM project management and USFS staff; identify BLM resource databases the consultant will need to prepare the EIS; and discuss preliminary alternative routes.
September 17, 2009	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Discuss resource issues associated with alternative routes identified in the BLM Price Field Office.
May 31, 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office	Reintroduce and discuss the Project.
June 2, 2011	▪ BLM Wyoming State Office ▪ BLM Moab Field Office	Reintroduce and discuss the Project.
August 30, 2011	▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Utah State Office	Brief the BLM State Directors on the status of the Project, including the results of project scoping.
November 30, 2011	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ Western Area Power Administration (representing the TransWest Express project) ▪ Dixie National Forest	Coordination meeting of the BLM, Western Area Power Administration, and USFS to discuss consistency of study and analysis approaches for the two projects.
April 12, 2012	▪ BLM Wyoming State Office ▪ Dixie National Forest ▪ Western Area Power Administration (representing the TransWest Express project)	Coordination meeting of the BLM, USFS staff, and Western Area Power Administration to discuss consistency of study and analysis approaches for biological and visual resources for the two projects.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
May 2, 2012	▪ BLM Wyoming State Office ▪ Dixie National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest	Coordination meeting of the BLM, USFS, and the third-party contractors for the Energy Gateway South (EPG) and TransWest Express (AECOM) projects to discuss consistency of analysis for inventoried roadless areas and unroaded and undeveloped areas.
May 16, 2012	▪ BLM Wyoming State Office ▪ Uinta-Wasatch-Cache National Forest ▪ Dixie National Forest	BLM and USFS management briefing to discuss the status Energy Gateway South, TransWest Express, and Sigurd to Red Butte No. 2 – 345kV transmission projects.
May 24, 2012	▪ BLM Wyoming State Office ▪ Western Area Power Administration	Coordination meeting of the BLM, Western Power Administration, and the third-party contractors for the Energy Gateway South (EPG) and TransWest Express (AECOM) projects to discuss consistency of study and analysis approaches for the two projects.
October 3, 2012	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ BLM Colorado State Office ▪ BLM Northwest District Office ▪ BLM Utah State Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ Uinta-Wasatch-Cache National Forest ▪ Dixie National Forest	Briefing on the status of the Project to the BLM State Directors and USFS management. Included discussion of the results of coordination efforts with the Agency Interdisciplinary Team and cooperating agencies on the review of impacts and route comparisons.
December 14, 2012	▪ BLM Wyoming State Office ▪ BLM Utah State Office	Discuss sage-grouse issues and routing options in the Emma Park area in Utah.
January 22, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ Rocky Mountain Power	Discuss sage-grouse issues and routing options in the Emma Park area, Utah, with Rocky Mountain Power.
February 8, 2013	▪ BLM Wyoming State Office ▪ USFS Interdisciplinary Team	Discuss USFS specialist reports and comments related to a USFS decision.
March 12, 2013	▪ BLM Colorado State Office ▪ BLM Northwest District Office ▪ BLM Little Snake Field Office	Discuss agency-requested route adjustments.
March 13, 2013	▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ Dixie National Forest	Discuss agency-requested route adjustments.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
April 24, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ Uinta-Wasatch-Cache National Forest ▪ Dixie National Forest ▪ Rocky Mountain Power	Discuss the plan of development for the Project as well as inventoried roadless areas.
May 24, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss analysis and documentation of effects on inventoried roadless areas and unroaded/undeveloped areas.
June 4, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Color Country District ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Richfield Field Office ▪ BLM Salt Lake Field Office ▪ BLM Vernal Field Office ▪ Dixie National Forest ▪ Uinta-Wasatch-Cache National Forest	Brief BLM and USFS management on the status of the Project and discuss an agency-preferred route and potential plan amendments.
June 6, 2013	▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Northwest District Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office	Brief BLM management on the status of the Project and discuss an agency-preferred route and potential plan amendments.
June 7, 2013	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office	Brief BLM management on the status of the Project and discuss an agency-preferred route and potential plan amendments.
June 27, 2013	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office	Discuss routing issues and an agency-preferred route in southern Wyoming.
August 22, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss analysis and documentation of effects on inventoried roadless areas and unroaded/undeveloped areas.
October 22, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss USFS comments related to USFS decision.
October 30, 2013	▪ BLM Wyoming State Office ▪ USFS	Discuss USFS comments related to USFS decision.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
December 3, 2013	▪ BLM Washington Office ▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Utah State Office ▪ BLM National Operations Center ▪ U.S. Department of the Interior, Office of Environmental Policy and Compliance ▪ U.S. Department of the Interior, Office of the Regional Solicitor ▪ USFS Intermountain Region ▪ Dixie National Forest	Brief BLM Washington Office on the status of the Project and review the print-ready Draft EIS.
December 16, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team	Discuss resource issues associated with alternative routes in the BLM Vernal Field Office.
January 24, 2014	▪ BLM Washington (DC) Office ▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Utah State Office ▪ BLM Nevada State Office ▪ BLM Oregon State Office ▪ BLM National Transmission Support Team	Discuss methodology for migratory bird habitat analysis methodology.
March 13, 2014	▪ BLM Wyoming State Office ▪ Dixie National Forest	Discuss colocation of the Energy Gateway South and TransWest Express projects in the Spanish Fork Canyon, Thistle Creek Valley/Cedar Knoll area, and Uinta Basin in Utah.
April 23, 2014	▪ BLM Wyoming State Office ▪ BLM National Transmission Support Team	Discuss colocation of Energy Gateway South and TransWest Express projects in the Deerlodge Entrance Road area of Dinosaur National Monument (Colorado) and Emma Park area (Utah).
May 1, 2014	▪ BLM Wyoming State Office ▪ BLM Colorado Northwest District Office ▪ BLM Little Snake Field Office ▪ BLM Utah State Office ▪ BLM Price Field Office ▪ BLM Salt Lake Field Office ▪ BLM National Transmission Support Team ▪	Discuss colocation of Energy Gateway South and TransWest Express projects in the Deerlodge Entrance Road area of Dinosaur National Monument (Colorado) and Emma Park area (Utah).
July 11, 2014	▪ BLM Washington Office ▪ BLM Wyoming State Office	Briefing to BLM Washington Office regarding the Energy Gateway South project and the subject of sage-grouse.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
July 17, 2014	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Colorado State Office ▪ BLM White River Field Office ▪ BLM Utah State Office	Discuss the path of the agency-preferred alternative south of Wamsutter, Wyoming, and in the Colorado-Utah border area.
November 13, 2014	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Colorado State Office ▪ BLM Little Snake Field Office ▪ BLM Utah State Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team ▪ U.S. Forest Service ▪ Rocky Mountain Power	Discuss preparation of the Plan of Development
November 14, 2014	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team	Discuss agency-preferred alternative route in the Argyle Canyon and Camp Timberlane areas (Utah).
December 4, 2014	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Vernal Field Office	Review and discuss BLM comments on the first draft Biological Assessment.
December 16, 2014	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team	Discuss mitigation for sclerocactus in the Uinta Basin.
March 2, 2015	▪ BLM Wyoming State Office ▪ BLM Utah State Office	Review and discuss U.S. Fish and Wildlife (FWS) comments on the second draft Biological Assessment.
April 8, 2015	▪ BLM Wyoming State Office	Discuss mitigation structure types for sage-grouse.
April 13, 2015	▪ BLM Wyoming State Office ▪ BLM Washington Office	Briefing to BLM Washington Office regarding the Energy Gateway South project and the subject of sage-grouse.
April 23, 2015	▪ BLM Wyoming State Office ▪ BLM Washington Office	Discuss compensatory mitigation, as it relates to areas where the project crosses non-lands with wilderness characteristics, suitable Wild and Scenic River segment, and national trails in the Final EIS.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
May 5, 2015	▪ BLM Washington Office ▪ BLM Wyoming State Office	Briefing to BLM Washington Office regarding the Energy Gateway South project and the subject of sage-grouse disturbance caps described in BLM resource management plan amendment EISs.
May 19, 2015	▪ BLM Wyoming State Office ▪ BLM Washington Office ▪ BLM Rawlins Field Office ▪ BLM Colorado State Office ▪ BLM Little Snake Field Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team	Discuss compensatory mitigation, as it relates to areas where the project crosses non-lands with wilderness characteristics, suitable Wild and Scenic River segment, and national trails in the Final EIS.
Other Cooperating Agencies		
May 21, 2009	▪ BLM Wyoming State Office ▪ Hill Air Force Base ▪ BLM West Desert District ▪ BLM Fillmore Field Office ▪ BLM Salt Lake Field Office ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships among BLM project management, BLM field office staff, and Hill Air Force Base; identify resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
June 2, 2009	▪ BLM Wyoming State Office ▪ Millard County (Utah) ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Introduce and establish working relationships between BLM project management and Millard County; identify resource databases the third-party consultant will need to prepare the EIS; and discuss preliminary alternative routes.
June 12, 2009	▪ BLM Wyoming State Office ▪ BLM Little Snake Field Office ▪ Colorado State Land Board ▪ Colorado Division of Wildlife ▪ Moffat County	Discuss routing issues associated with alternative routes located in the BLM Little Snake Field Office and Moffat County.
April 1, 2010	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ USFS ▪ U.S. Army Corps of Engineers ▪ Utah Public Lands Policy Coordination Office ▪ Rocky Mountain Power	Discuss resource issues associated with alternative routes identified in the Nine Mile Canyon area of the BLM Price Field Office.
April 7, 2010	▪ BLM Wyoming State Office ▪ Duchesne County (Utah)	Discuss resource issues associated with alternative routes located in the Argyle Canyon area.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO JUNE 2015		
Date	**Agency/Organization**	**Meeting Topic**
July 29, 2010	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ BLM Little Snake Field Office ▪ U.S. Fish and Wildlife Service (FWS), Wyoming Ecological Services Field Office ▪ Wyoming Governor's Office ▪ Wyoming Game and Fish Department ▪ Carbon County (Wyoming) ▪ Little Snake River Conservation District (Wyoming) ▪ Saratoga-Encampment-Rawlins Conservation District (Wyoming) ▪ Rocky Mountain Power	Discuss resource issues associated with alternative routes located in southern Wyoming.
June 1, 2011	▪ BLM Wyoming State Office ▪ Carbon County (Wyoming) ▪ Sweetwater County (Wyoming) ▪ Moffat County (Colorado)	Discuss alternative routes for the Energy Gateway South and TransWest Express projects.
September 13, 2011	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ Wyoming Game and Fish Department ▪ Sweetwater County (Wyoming) ▪ Medicine Bow Conservation District (Wyoming) ▪ Saratoga-Encampment-Rawlins Conservation District ▪ Sweetwater County Conservation District	Review project management and administration protocols, review scoping activities and results, review alternative routes being carried forward, discuss potential plan amendments, review schedule, and discuss data collection and inventories.
September 14, 2011	Agency Interdisciplinary Team Meeting – Craig, Colorado ▪ BLM Wyoming State Office ▪ BLM Grand Junction Field Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ FWS, Colorado Ecological Services Field Office ▪ Colorado Parks and Wildlife ▪ Utah Division of Wildlife Resources ▪ Moffat County (Colorado) ▪ Uintah County (Utah)	Review project management and administration protocols, review scoping activities and results, review alternative routes being carried forward, discuss potential plan amendments, review schedule, and discuss data collection and inventories.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
September 16, 2011	Agency Interdisciplinary Team Meeting – Price, Utah ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ Ashley National Forest ▪ Dixie National Forest ▪ Fishlake National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ FWS, Utah Ecological Services Field Office ▪ Utah Reclamation Mitigation and Conservation Commission (URMCC) ▪ Utah Public Lands Policy Coordination Office ▪ Utah Division of Wildlife Resources ▪ Carbon County (Utah) ▪ Emery County (Utah) ▪ Sanpete County (Utah)	Review project management and administration protocols, review scoping activities and results, review alternative routes being carried forward, discuss potential plan amendments, review schedule, and discuss data collection and inventories.
October 27, 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ Emery County (Utah)	Discuss resource issues associated with alternative routes in the San Rafael Swell area of the BLM Price Field Office.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
December 13, 2011	Agency Interdisciplinary Team Conference Call ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ BLM Colorado State Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ Ashley National Forest ▪ Dixie National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Bureau of Indian Affairs, Western Region ▪ FWS, Colorado Ecological Services Field Office ▪ FWS, Utah Ecological Services Field Office ▪ URMCC ▪ Colorado Division of Parks and Wildlife ▪ Utah Division of Wildlife Resources ▪ Sweetwater County (Wyoming) ▪ Carbon County (Utah) ▪ Duchesne County (Utah) ▪ Uintah County (Utah)	Introduce and discuss the impact assessment and mitigation planning process, explain how the alternative routes will be screened and compared, as well as the status of the scoping report, alternative routes, resource inventory with the Agency Interdisciplinary Team.
December 15, 2011	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ Emery County (Utah)	Discuss resource issues associated with alternative routes in the San Rafael Swell area of the BLM Price Field Office.
May 13, 2012	▪ BLM Wyoming State Office ▪ Moffat County (Colorado)	Meeting with Moffat County Land Use Board to discuss detailed inventory review maps and identify input needed from Moffat County.
July 17, 2012	▪ BLM Wyoming State Office ▪ BLM Price Field Office ▪ BLM Richfield Field Office ▪ BLM Vernal Field Office ▪ Ashley National Forest ▪ Dixie National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Utah Division of Wildlife Resources ▪ Carbon County (Utah) ▪ Duchesne County (Utah) ▪ Sanpete County (Utah)	Meeting with Carbon, Duchesne, and Sanpete counties, as well as the USFS to discuss routing options.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO JUNE 2015		
Date	**Agency/Organization**	**Meeting Topic**
August 20, 2012	Agency Interdisciplinary Team Meeting – Price, Utah ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Richfield Field Office ▪ BLM Vernal Field Office ▪ USFS Intermountain Region ▪ Ashley National Forest ▪ Dixie National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ FWS, Utah Ecological Services Field Office ▪ URMCC ▪ Bureau of Indian Affairs, Uintah and Ouray Agency ▪ Utah Division of Wildlife Resources ▪ Utah Public Lands Policy Coordination Office ▪ Carbon County (Utah) ▪ Emery County (Utah) ▪ Sanpete County (Utah) ▪ Wyoming Coalition of Governments (representing Wyoming counties)	Meet with the Agency Interdisciplinary Team to review results of the impact assessment and mitigation planning, review the approach and results of the alternative route screening and comparison, and review and discuss alternative routes to be considered in detail in the EIS.
August 21, 2012	▪ BLM Wyoming State Office ▪ Dixie National Forest ▪ Uinta-Wasatch-Cache National Forest	Discuss resource issues associated with alternative routes on the national forest.
August 22, 2012	Agency Interdisciplinary Team Meeting – Craig, Colorado ▪ BLM Wyoming State Office ▪ BLM Grand Junction Field Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ BLM National Operations Center ▪ FWS, Colorado Ecological Services Field Office ▪ Colorado Parks and Wildlife ▪ Moffat County (Colorado) ▪ Uintah County (Utah)	Meet with the Agency Interdisciplinary Team to review results of the impact assessment and mitigation planning, review the approach and results of the alternative route screening and comparison, and review and discuss alternative routes to be considered in detail in the EIS.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
August 23, 2012	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Rock Springs Field Office ▪ FWS, Wyoming Ecological Services Field Office ▪ Wyoming Governor's Office ▪ Wyoming Game and Fish Department ▪ Carbon County (Wyoming) ▪ Sweetwater County (Wyoming) ▪ Little Snake River Conservation District (Wyoming) ▪ Saratoga-Rawlins-Encampment Conservation District (Wyoming) ▪ Wyoming Coalition of Governments	Meet with the Agency Interdisciplinary Team to review results of the impact assessment and mitigation planning, review the approach and results of the alternative route screening and comparison, and review and discuss alternative routes to be considered in detail in the EIS.
September 6, 2012	▪ BLM Wyoming State Office ▪ URMCC	Discuss routing issues associated with alternative routes crossing properties managed by the URMCC.
September 10, 2012	▪ BLM Wyoming State Office ▪ Moffat County	Meeting with Moffat County Land Use Board and Rocky Mountain Power to discuss the Project.
November 8, 2012	▪ BLM Wyoming State Office ▪ URMCC	Meeting with the URMCC (a cooperating agency) to introduce and discuss the Project with other members of the Central Utah Project Bonneville Unit Working Group (including the Bureau of Reclamation and Central Utah Water Conservancy District).
November 16, 2012	▪ BLM ▪ USFS ▪ FWS ▪ Utah Division of Wildlife Resources ▪ Colorado Parks and Wildlife ▪ Wasatch County (Utah) ▪ Duchesne County (Utah) ▪ Carbon County (Utah) ▪ Sweetwater County Conservation District ▪ Saratoga-Encampment-Rawlins Conservation District ▪ URMCC ▪ Uintah Basin Adaptive Resource Management Local Working Group ▪ Rocky Mountain Power	Meeting to initiate and discuss the greater sage-grouse habitat equivalent analysis (HEA) process.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
December 12, 2012	▪ BLM ▪ USFS ▪ FWS ▪ Colorado Parks and Wildlife ▪ Wyoming Game and Fish Department ▪ Uintah County (Utah) ▪ Rocky Mountain Power	Meeting to summarize the HEA process and the relationship to the National Environmental Policy Act (NEPA) process; confirm use of the framework for sage-grouse impacts analysis.
December 19, 2012	▪ BLM Wyoming State Office ▪ BLM Northwest District Office ▪ BLM Little Snake Field Office ▪ National Park Service (NPS) ▪ Colorado Parks and Wildlife	Discuss routing issues along U.S. Highway 40 in the vicinity of the Tuttle Ranch Conservation Easement and the Deerlodge Road entrance of Dinosaur National Monument.
January 23, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ Dixie National Forest	Discuss and review the schedule for Section 7 consultation, requirements for any field surveys in support of the consultation, and discuss the EIS and consultation schedules.
January 24, 2013	▪ BLM Wyoming State Office ▪ BLM Little Snake Field Office ▪ FWS, Colorado Ecological Services Field Office	Discuss and review the schedule for Section 7 consultation, requirements for any field surveys in support of the consultation, and discuss the EIS and consultation schedules.
January 25, 2013	▪ BLM ▪ FWS ▪ Colorado Parks and Wildlife ▪ Utah Division of Wildlife Resources	Meeting to discuss parameters to be included in the sage-grouse HEA.
January 28, 2013	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ FWS, Wyoming Ecological Services Field Office	Discuss and review the schedule for Section 7 consultation, requirements for any field surveys in support of the consultation, and discuss the EIS and consultation schedules.
January 31, 2013	▪ BLM ▪ FWS	Meeting to review the proposed HEA habitat services metric.
February 5, 2013	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ Wyoming Governor's Office ▪ Carbon County (Wyoming) ▪ Sweetwater County (Wyoming) ▪ Saratoga-Rawlins-Encampment Conservation District (Wyoming)	Discuss agency comments on the first internal Draft EIS, review route adjustments to be incorporated into the second internal Draft EIS, and begin discussion of an agency-preferred alternative route.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO JUNE 2015		
Date	**Agency/Organization**	**Meeting Topic**
February 6, 2013	Agency Interdisciplinary Team Meeting – Craig, Colorado ▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Little Snake Field Office ▪ BLM White River Field Office ▪ BLM National Operations Center ▪ NPS ▪ Colorado Parks and Wildlife ▪ Moffat County (Colorado) ▪ Uintah County (Utah)	Discuss agency comments on the first internal Draft EIS, review route adjustments to be incorporated into the second internal Draft EIS, and begin discussion of an agency-preferred alternative route.
February 7, 2013	Agency Interdisciplinary Team Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Fillmore Field Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ BLM Vernal Field Office ▪ Bureau of Indian Affairs, Uintah and Ouray Agency ▪ Dixie National Forest ▪ Fishlake National Forest ▪ Manti-La Sal National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ URMCC ▪ Utah Division of Wildlife Resources ▪ Carbon County (Utah) ▪ Duchesne County (Utah) ▪ Emery County (Utah) ▪ Wasatch County (Utah)	Discuss agency comments on the first internal Draft EIS, review route adjustments to be incorporated into the second internal Draft EIS, and begin discussion of an agency-preferred alternative route.
February 28, 2013	▪ BLM ▪ FWS ▪ USFS ▪ U.S. Geological Survey	Discuss potential effects on clay phacelia and Deseret milkvetch.
March 4, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss potential effects on migratory bird habitat.
March 14, 2013	▪ BLM ▪ FWS ▪ Colorado Parks and Wildlife ▪ Utah Division of Wildlife Resources ▪ Saratoga-Encampment-Rawlins Conservation District ▪ Rocky Mountain Power	Review comments received on the draft HEA.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
March 15, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss considerations pertinent to assessing the feasibility of the Project through Spanish Fork Canyon.
March 20, 2013	Old Spanish National Historic Trail Stakeholder Meeting – Green River, Utah ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Moab Field Office ▪ BLM Price Field Office ▪ NPS ▪ Old Spanish Trail Association	Discuss the Old Spanish National Historic Trail resources, qualities, values, associated setting, and primary uses in response to BLM Manual 6280.
March 21, 2013	Continental Divide National Scenic Trail Stakeholder Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ USFS, Rocky Mountain Region ▪ Continental Divide Trail Coalition ▪ Continental Divide Trail Society ▪ Alliance for Historic Wyoming	Discuss the Continental Divide National Scenic Trail resources, qualities, values, associated setting, and primary uses in response to BLM Manual 6280.
March 21, 2013	Cherokee and Overland Historic Trails Stakeholder Meeting – Rawlins, Wyoming ▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ NPS ▪ Oregon-California Trails Association ▪ Alliance for Historic Wyoming	Discuss the Cherokee and Overland Historic Trail resources, qualities, values, associated setting, and primary uses in response to BLM Manual 6280.
March 28, 2013	▪ BLM Wyoming State Office ▪ NPS ▪ Rocky Mountain Power ▪ TransWest Express, LLC ▪ BLM Colorado State Office ▪ Colorado Parks and Wildlife	Preliminary meeting to discuss application for right-of-way to cross Deerlodge Road entrance of Dinosaur National Monument.
April 2, 2013	▪ BLM ▪ FWS	Discuss roles, responsibilities, timeframes for developing sage-grouse mitigation, and the sage-grouse analysis framework.
April, 4, 2013	▪ BLM ▪ FWS ▪ Rocky Mountain Power	Discuss the use of the sage-grouse framework for the Project and how direct and indirect impacts would be addressed in the HEA and the EIS.
April 24, 2013	▪ BLM ▪ FWS	Discuss the greater sage-grouse HEA; review the purpose of the mitigation plan and HEA documents in the sage-grouse framework.
April 29, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss clay phacelia and Uinta Basin hookless cactus.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
July 17, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss the analysis for potential effects on migratory bird habitat.
September 12, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss additional conservation measures needed to minimize impacts on migratory bird habitat.
November 1, 2013	▪ BLM ▪ FWS ▪ USFS	Discuss data and methodology for assessing impacts on migratory birds and the process for refining conservation measures to minimize potential impacts on migratory bird habitat.
December 3, 2013	▪ BLM Wyoming State Office ▪ BLM Rawlins Field Office ▪ BLM Utah State Office ▪ BLM Little Snake Field Office ▪ FWS, Wyoming Ecological Services Field Office ▪ FWS, Western Colorado Field Office ▪ FWS, Utah Ecological Services Field Office ▪ Colorado Parks and Wildlife ▪ Utah Division of Wildlife Resources ▪ Saratoga-Encampment-Rawlins Conservation District	Review and discuss BLM framework for sage-grouse HEA.
December 5, 2013	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ FWS, Utah Ecological Services Field Office ▪ USFS ▪ Utah Division of Wildlife Resources	Discuss development of additional Deseret milkvetch conservation measures and transmission line siting in the vicinity of Deseret milkvetch habitat.
January 7, 2014	▪ BLM Utah State Office ▪ BLM National Transmission Support Team ▪ FWS, Utah Ecological Services Field Office ▪ USFS ▪ Utah Department of Natural Resources ▪ Utah Division of Wildlife Resources	Review and discuss potential habitat for Deseret milkvetch.
March 3, 2014	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Little Snake Field Office ▪ BLM National Transmission Support Team ▪ FWS, Wyoming Ecological Services Field Office ▪ FWS, Western Colorado Field Office ▪ FWS, Utah Ecological Services Field Office	Discuss preparation of the Biological Assessment.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
March 6, 2014	▪ BLM Wyoming State Office ▪ USFS ▪ Western Area Power Administration ▪ Rocky Mountain Power ▪ TransWest Express LLC	Monthly route colocation coordination meeting of the Energy Gateway South and TransWest Express projects.
March 14, 2014	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Price Field Office ▪ BLM Salt Lake Field Office ▪ BLM Vernal Field Office ▪ Dixie National Forest ▪ Western Area Power Administration	Discuss colocation of the Energy Gateway South and TransWest Express projects in the Spanish Fork Canyon, Thistle Creek Valley/Cedar Knoll area, and Uinta Basin in Utah.
March 27, 2014	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Salt Lake Field Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team ▪ Dixie National Forest ▪ Uinta-Wasatch-Cache National Forest ▪ Western Area Power Administration ▪ Rocky Mountain Power ▪ TransWest Express LLC	Discuss colocation of the Energy Gateway South and TransWest Express projects in the Spanish Fork Canyon, Thistle Creek Valley/Cedar Knoll area, and Uinta Basin in Utah.
April 3, 2014	▪ BLM Wyoming State Office ▪ Dixie National Forest ▪ Rocky Mountain Power ▪ TransWest Express LLC	Monthly route colocation coordination meeting of the Energy Gateway South and TransWest Express projects.
May 1, 2014	▪ BLM ▪ Western Area Power Administration ▪ USFS ▪ Rocky Mountain Power ▪ TransWest Express LLC	Monthly route colocation coordination meeting of the Energy Gateway South and TransWest Express projects.
May 1, 2014	▪ BLM Wyoming State Office ▪ Rocky Mountain Power	Discussion alternative routes in the Argyle Canyon area.
May 2, 2014	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM National Transmission Support Team ▪ Western Area Power Administration ▪ Rocky Mountain Power ▪ TransWest Express LLC	Discuss colocation of Energy Gateway South and TransWest Express projects in the Deerlodge Entrance Road area of Dinosaur National Monument (Colorado) and Emma Park area (Utah).
June 18, 2014	▪ BLM Wyoming State Office ▪ BLM National Transmission Support Team ▪ Rocky Mountain Power	Discuss alternative routes in the Argyle Canyon and Camp Timberlane areas (Utah).

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
June 27, 2014	▪ BLM Wyoming State Office ▪ BLM National Transmission Support Team ▪ Rocky Mountain Power	Discussion of water use for the Energy Gateway South project within the Platte River Basin, Wyoming Closed Basin, and Colorado River Basin.
June 27, 2014	▪ BLM Wyoming State Office ▪ BLM National Transmission Support Team ▪ Rocky Mountain Power	Review the impact assessment and mitigation planning process and discuss selective mitigation measures used in the Draft EIS.
June 30, 2014	▪ BLM Wyoming State Office ▪ USFS ▪ Rocky Mountain Power	Discuss USFS' fire analysis and fire-break concept for Energy Gateway South project.
September 18, 2014	▪ BLM Wyoming State Office ▪ USFS	Discuss visual issues associated with crossing U.S. Highway 6 in Spanish Fork Canyon, as well as the location of the key observation point and simulation in this area.
October 15, 2014	▪ BLM Wyoming State Office ▪ BLM National Transmission Support Team ▪ Rocky Mountain Power	Discuss Rocky Mountain Power's sage-grouse mitigation plan.
November 12, 2014	▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Little Snake Field Office ▪ BLM National Transmission Support Team ▪ FWS, Wyoming Ecological Services Field Office ▪ FWS, Utah Ecological Services Field Office ▪ USFS ▪ Wyoming Game and Fish Department ▪ Colorado Parks and Wildlife ▪ Utah Division of Wildlife Resources ▪ Rocky Mountain Power	Review and discuss comments received on the draft HEA.
March 23, 2015	▪ BLM ▪ FWS	Review and discuss FWS comments on the second draft Biological Assessment.

TABLE C-1 AGENCY AND STAKEHOLDER MEETINGS FEBRUARY 2009 TO JUNE 2015		
Date	**Agency/Organization**	**Meeting Topic**
June 2, 2015	▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ BLM Little Snake Field Office ▪ NPS ▪ Natural Resources Conservation Service ▪ FWS ▪ Western ▪ Colorado Parks and Wildlife ▪ Moffat County (Colorado) ▪ Colorado Cattleman’s Agricultural Land Trust ▪ Cross Mountain Ranch ▪ Rocky Mountain Power ▪ TransWest Express, LLC	Discuss proposed alignments for Energy Gateway South and TransWest Express projects in northwest Colorado.
June 8, 2015	▪ BLM Wyoming State Office ▪ BLM Colorado State Office ▪ NPS ▪ Natural Resources Conservation Service ▪ FWS ▪ Western ▪ Colorado Parks and Wildlife ▪ Colorado State Land Board ▪ Moffat County (Colorado)	Discuss proposed alignments for Energy Gateway South and TransWest Express projects in northwest Colorado.
Tribes		
April 23, 2012	Ute Tribe	Introduce and discuss the Project with the Ute Tribe Energy & Minerals Department.
May 31, 2012	Presentation to Tri-Ute Association ▪ Northern Ute Tribe ▪ Southern Ute Tribe ▪ Ute Mountain Tribe	Introduce and discuss the Project with the Tri-Ute association.
August 4, 2014	▪ Ute Tribe ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ BLM Vernal Field Office ▪ BLM National Transmission Support Team ▪ Uinta-Wasatch-Cache National Forest ▪ Dixie National Forest ▪ Western Area Power Administration ▪ Rocky Mountain Power ▪ TransWest Express LLC	Provide update on status of project to Ute Tribe Business Committee.
May 20, 2015	▪ Ute Tribe ▪ BLM National Transmission Support Team – Cultural Resources	Provide an update on status of project and Programmatic Agreement to Ute Tribe Director of Cultural Rights and Protection.
Local Governments		
April 20, 2009	Carbon County (Wyoming)	Discuss potential land use issues and permitting.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
April 20, 2009	Sweetwater County (Wyoming)	Discuss potential land use issues and permitting.
April 20, 2009	Nephi City (Utah)	Discuss potential land use issues and permitting.
April 21, 2009	Daggett County (Utah)	Discuss potential land use issues and permitting.
April 21, 2009	Uintah County (Utah)	Discuss potential land use issues and permitting.
April 22, 2009	Duchesne County (Utah)	Discuss potential land use issues and permitting.
April 22, 2009	Milford City (Utah)	Discuss potential land use issues and permitting.
April 23, 2009	Naples City (Utah)	Discuss potential land use issues and permitting.
April 23, 2009	Fillmore City (Utah)	Discuss potential land use issues and permitting.
April 27, 2009	Beaver County (Utah)	Discuss potential land use issues and permitting.
April 30, 2009	Washington County (Utah)	Discuss potential land use issues and permitting.
May 4, 2009	Town of Baggs (Wyoming)	Discuss potential land use issues and permitting.
May 5, 2009	Moffat County (Colorado)	Discuss potential land use issues and permitting.
May 6, 2009	Town of Rangely (Colorado)	Discuss potential land use issues and permitting.
May 12, 2009	Mount Pleasant City (Utah)	Discuss potential land use issues and permitting.
May 13, 2009	Sanpete County (Utah)	Discuss potential land use issues and permitting.
May 14, 2009	City of Green River (Utah)	Discuss potential land use issues and permitting.
May 14, 2009	Grand County (Utah)	Discuss potential land use issues and permitting.
May 18, 2009	Emery County (Utah)	Discuss potential land use issues and permitting.
May 19, 2009	Huntington City (Utah)	Discuss potential land use issues and permitting.
May 20, 2009	Carbon County (Utah)	Discuss potential land use issues and permitting.
May 20, 2009	Helper City (Utah)	Discuss potential land use issues and permitting.
May 20, 2009	Juab County (Utah)	Discuss potential land use issues and permitting.
May 28, 2009	Iron County (Utah)	Discuss potential land use issues and permitting.
June 5, 2009	Town of Ballard (Utah)	Discuss potential land use issues and permitting.
June 8, 2009	Garfield County (Colorado)	Discuss potential land use issues and permitting.

TABLE C-1
AGENCY AND STAKEHOLDER MEETINGS
FEBRUARY 2009 TO JUNE 2015

Date	Agency/Organization	Meeting Topic
June 8, 2009	Rio Blanco County (Colorado)	Discuss potential land use issues and permitting.
June 9, 2009	Mesa County (Colorado)	Discuss potential land use issues and permitting.
June 9, 2009	Utah County (Utah)	Discuss potential land use issues and permitting.
June 10, 2009	Roosevelt City (Utah)	Discuss potential land use issues and permitting.
June 10, 2009	Wasatch County (Utah)	Discuss potential land use issues and permitting.
June 15, 2009	Beaver City (Utah)	Discuss potential land use issues and permitting.
June 15, 2009	Sevier County (Utah)	Discuss potential land use issues and permitting.
August 9, 2009	Town of Dixon (Wyoming)	Discuss potential land use issues and permitting.
Interested Parties		
April 11, 2012	Interested Parties Meeting: ▪ BLM Wyoming State Office ▪ BLM Utah State Office ▪ Dixie National Forest ▪ Wyoming State Historic Preservation Office ▪ Colorado State Historic Preservation Office ▪ Utah Public Lands Policy Coordination Office ▪ Huntington Eccles Scenic Byway ▪ Old Spanish Trail Association ▪ Oregon-California Trails Association	Introduce the Project; discuss the National Environmental Policy Act and Section 106 of the National Historic Preservation Act; and discuss the purpose, use, and development of a Programmatic Agreement with interested parties that responded to the BLM's invitation.
July 25, 2013	Consulting Parties Meeting (Rawlins, Wyoming)	Review and discuss the content of the draft Programmatic Agreement.
July 26, 2013	Consulting Parties Meeting (Craig, Colorado)	Review and discuss the content of the draft Programmatic Agreement.
July 30, 2013	Consulting Parties Meeting (Price, Utah)	Review and discuss the content of the draft Programmatic Agreement.
June 24, 2014	Consulting Parties Meeting (Salt Lake City, Utah)	Review and discuss content of the draft Programmatic Agreement.
June 25, 2014	Consulting Parties Meeting (Salt Lake City, Utah)	Review and discuss content of the draft Programmatic Agreement.

TABLE C-2
APPLICANT-INITIATED PUBLIC OUTREACH SUMMARY (MAILINGS)
JANUARY 2009 TO MAY 2013

Mailing Type	Date	Number of Copies Sent
Company newsletter	June 2011	9,500
Letter to landowners - Wyoming	Up to May 2013	388
Letter to landowners - Colorado	Up to May 2013	650
Letter to landowners - Utah	Up to May 2013	5,614

TABLE C-3
APPLICANT-INITIATED PUBLIC OUTREACH SUMMARY (MEETINGS)
JANUARY 2009 TO OCTOBER 2014

Meeting Type/Title	Date	City, State
Briefing with Six County Association of Governments	January 7, 2009	Richfield, Utah
Briefing with Cedar City Chamber of Commerce	January 8, 2009	Cedar City, Utah
Briefing with Southeastern Utah Association of Governments	January 8, 2009	Price, Utah
Briefing with Garfield County, Colorado	January 12, 2009	Glenwood Springs, Colorado
Briefing with Moffat County, Colorado	January 12, 2009	Craig, Colorado
Briefing with Mesa County, Colorado	January 13, 2009	Grand Junction, Colorado
Briefing with Five County Association of Governments	January 21, 2009	St. George, Utah
Briefing with Uintah Basin Association of Governments	January 22, 2009	Vernal, Utah
Briefing with Six County Association of Governments	February 3, 2009	St. George, Utah
Briefing with Iron County Coordinating Council	February 4, 2009	Parowan, Utah
Briefing with Southeastern Utah Association of Local Governments (Sanpete, Sevier, Piute, Millard Counties)	February 5, 2009	Richfield, Utah
Briefing with Associated Governments of Northwestern Colorado	February 12, 2009	Rifle, Colorado
Energy Gateway Update for Utah Municipal Power Agency Annual Member Meeting	March 6, 2009	Salt Lake City, Utah
Carbon County Planning Meeting	April 23, 2009	Price, Utah
Briefing to Southwest Utah Technical Task Force meeting	June 11, 2009	Utah
Briefing to Utah County Commissioners	June 23, 2009	Provo, Utah
Briefing to Ute Indian Tribe Business Council, Uintah and Ouray Indian Reservation	December 16, 2009	Fort Duchesne, Utah
Briefing at Vernal Chamber of Commerce meeting	January 11, 2011	Vernal, Utah
Briefing at Utah Valley Exchange Club meeting	January 19, 2011	Orem, Utah
Briefing at American Society of Civil Engineering meeting	February 17, 2011	Provo, Utah
Briefing to Moffat County Land Use Board	March 14, 2011	Craig, Colorado
Briefing to Rio Blanco County Commission	March 14, 2011	Meeker, Colorado
Meeting with landowners	April 5, 2011	Vernal, Utah
Meeting with landowners	April 6, 2011	Rangely, Colorado
Meeting with landowners	April 7, 2011	Baggs, Wyoming
Meeting with landowners	April 7, 2011	Craig, Colorado
Meeting with landowners	April 13, 2011	Green River, Utah
Meeting with landowners	April 14, 2011	Price, Utah
Briefing to Grand County Council	April 19, 2011	Moab, Utah
Meeting with landowners	April 20, 2011	Mt. Pleasant, Utah
Meeting with landowners	April 21 2011	Nephi, Utah
Briefing to Moffat County Land Use Board	May 16, 2011	Craig, Colorado
Meeting with Energy & Minerals Department, Ute Indian Tribe, Uintah and Ouray Indian Reservation	May 25, 2011	Fort Duchesne, Utah
Meeting with Carbon County (Wyoming), Sweetwater County (Wyoming), and Moffat County (Colorado)	June 3, 2011	Rawlins, Wyoming
Briefing to Carbon County Council of Governments	July 20, 2011	Dixon, Wyoming
Meeting with Realty Officer, Bureau of Indian Affairs	September 19, 2011	Fort Duchesne, Utah
Meeting with Wasatch County Planning Director	November 29, 2011	Heber City, Utah
Briefing during Wasatch County Public Lands Committee meeting	January 4, 2012	Heber City, Utah
Meeting with Energy & Minerals Department, Ute Indian Tribe, Uintah and Ouray Indian Reservation	April 23, 2012	Fort Duchesne, Utah
Briefing to Moffat County Planning and Zoning Board	August 4, 2012	Craig, Colorado

TABLE C-3
APPLICANT-INITIATED PUBLIC OUTREACH SUMMARY (MEETINGS)
JANUARY 2009 TO OCTOBER 2014

Meeting Type/Title	Date	City, State
Briefing to Moffat County Land Use Board	September 10, 2012	Craig, Colorado
Community Working Group meeting 1	September 12, 2012	Rawlins, Wyoming
Community Working Group meeting 1	September 18, 2012	Salt Lake City, Utah
Community Working Group meeting 1	September 19, 2012	Nephi, Utah
Community Working Group meeting 1	September 20, 2012	Price, Utah
Community Working Group meeting 1	October 9, 2012	Vernal, Utah
Meeting with Uintah County Economic Development Director	November 15, 2012	Vernal, Utah
Briefing to the Nephi City Mayor and City Council	February 5, 2013	Nephi, Utah
Meeting with Questar to discuss processes/requirements for colocation with Questar facilities	January 21, 2014	Salt Lake City, Utah
Community Working Group meeting 2	February 18, 2014	Salt Lake City, Utah
Community Working Group meeting 2	February 19, 2014	Nephi, Utah
Community Working Group meeting 2	February 20, 2014	Price, Utah
Community Working Group meeting 2	February 26, 2014	Rawlins, Wyoming
Community Working Group meeting 2	February 27, 2014	Vernal, Utah
Meeting with Church of Jesus Christ of Latter-day Saints realty division	March 26, 2014	Salt Lake City, Utah
Meeting with Church of Jesus Christ of Latter-day Saints realty division	April 23, 2014	Salt Lake City, Utah
Meeting with Questar Pipeline Company to discuss parallel facilities	May 13, 2014	Salt Lake City, Utah
Meeting with Questar Pipeline Company and the BLM to discuss paralleling facilities in Uinta Basin	June 27, 2014	Salt Lake City, Utah
Site visit with Questar Pipeline Company and the BLM to discuss Questar facilities in the Uinta Basin, near the Green River	July 15, 2014	Uinta Basin, Utah
Meeting with State Institutional Lands Trust Administration	August 14, 2014	Salt Lake City, Utah
Meeting and site visit with Argyle Canyon landowners	September 3, 2014	Argyle Canyon, Utah
Conversation with FWS regarding migratory birds and Eagle Take Permit	October 2, 2014	Brigham City, Utah

Appendix D
U.S. Forest Service Supporting Data

APPENDIX D – U.S. FOREST SERVICE SUPPORTING DATA

Information in this appendix was compiled to supplement the Environmental Impact Statement (EIS) with additional information required by the U.S. Forest Service (USFS) to fully consider PacifiCorp's (doing business as Rocky Mountain Power [Applicant]), application for right-of-way across lands it administers. Section D.1 presents additional information associated with the USFS System being considered in the impact analysis for the Project. Section D.2 presents information on the management areas crossed by alternative routes considered for the Energy Gateway South Transmission Project (Project). Also, the section summarizes the selective mitigation measures applied to reduce high or moderate initial impacts identified in the impact analysis. As such, the selective mitigation measures provide a planning tool for minimizing potential adverse impacts. Once an alternative route is selected, the Applicant will coordinate with the USFS to refine the implementation of mitigation at specific locations or areas. Detailed mitigation will be incorporated in the Construction Plan of Development (POD) prior to Project construction (refer to Section 2.4 for additional information on the POD).

D.1 U.S. Forest Service Roads Data

Information in this section was compiled to inform the reader of the data associated with the USFS System being considered in the impact analysis for the Project. Roads identified in this appendix are within 750 feet of the Project alternative centerlines (refer to Section 2.4.2.3 Section 2.5.1.2). The USFS Road System within 750 feet of the Project alternative route centerlines in each national forest (Ashley, Uinta, and Manti-La Sal) is shown on Maps D-1 and D-2a through D-2f. Tables D-1 through D-3 summarize the U.S. Forest Service data associated with each road identified in the maps. Data summarized in the tables includes the road identification number, name, road classification, road maintenance level, road objective levels, and the road surface type.

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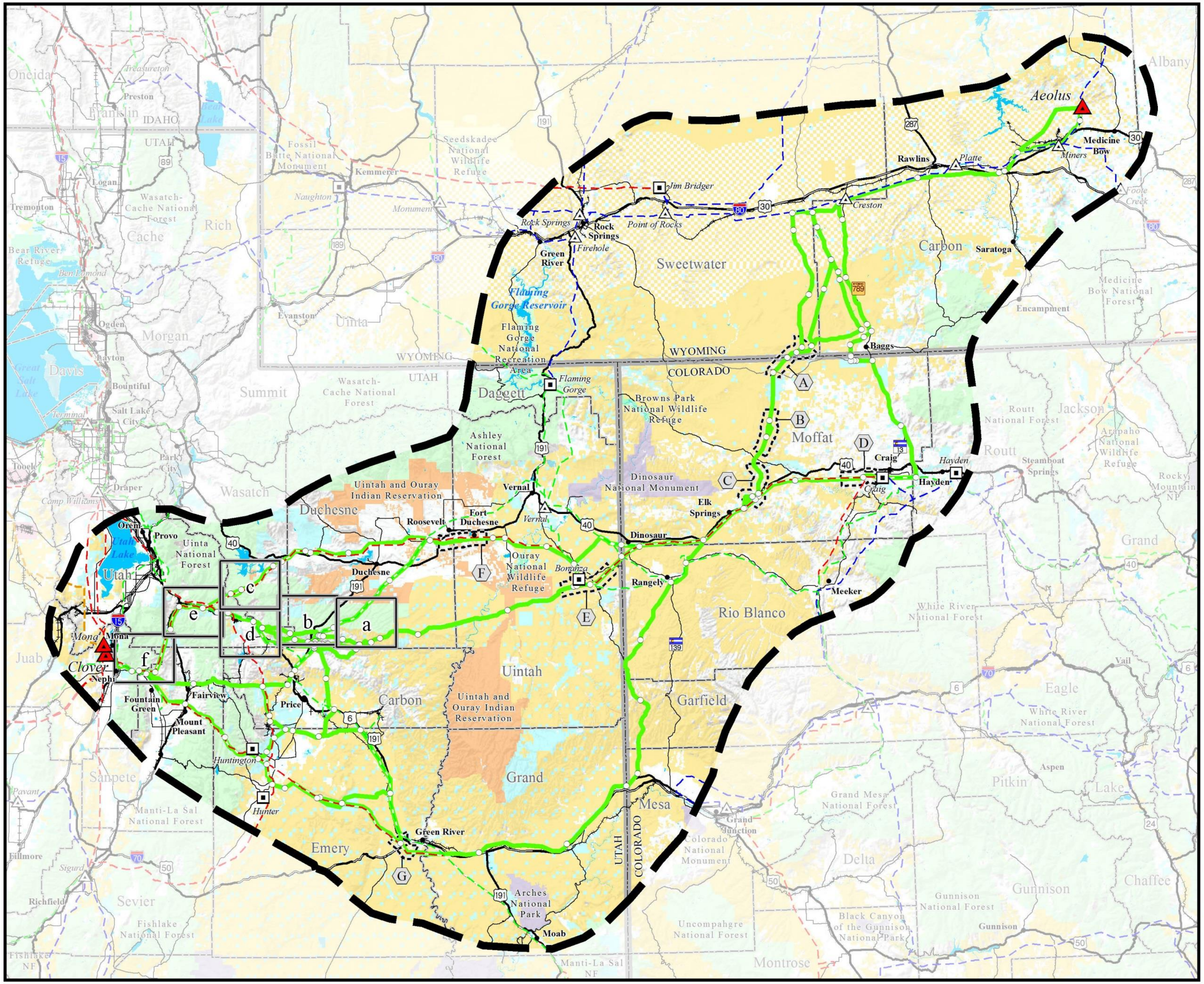

Map D-1
Project Area

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Alternative Routes and Transportation within National Forests

▭ Extent of Panel Area

Project Features

▬ Project Area Boundary	○ Link Node
▲ Substation (Project Terminal)	⬚ Series Compensation Station Siting Area
🟩 Alternative Route	

Land Ownership

🟨 Bureau of Land Management	🟩 U.S. Fish and Wildlife Service
🟨 Bureau of Reclamation	🟩 U.S. Forest Service
🟧 Indian Reservation	🟦 State Land
🟪 National Park Service	⬜ Private Land
🟪 U.S. Department of Defense	

General Reference

● City or Town	═ Interstate Highway
△ Substation	━ U.S. Highway
▣ Power Plant	─ State Highway
— 500kV Transmission Line	─ Other Road
— 345kV Transmission Line	🟦 Lake or Reservoir
— 230kV Transmission Line	▭ State Boundary
— 138kV Transmission Line	▭ County Boundary
┼ Railroad	

SOURCES:
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Water Features, ESRI 2008, USGS 2010; Highways, Roads, and Railroads, ESRI 2013;
State and County Boundaries, ESRI 2013

NOTE:
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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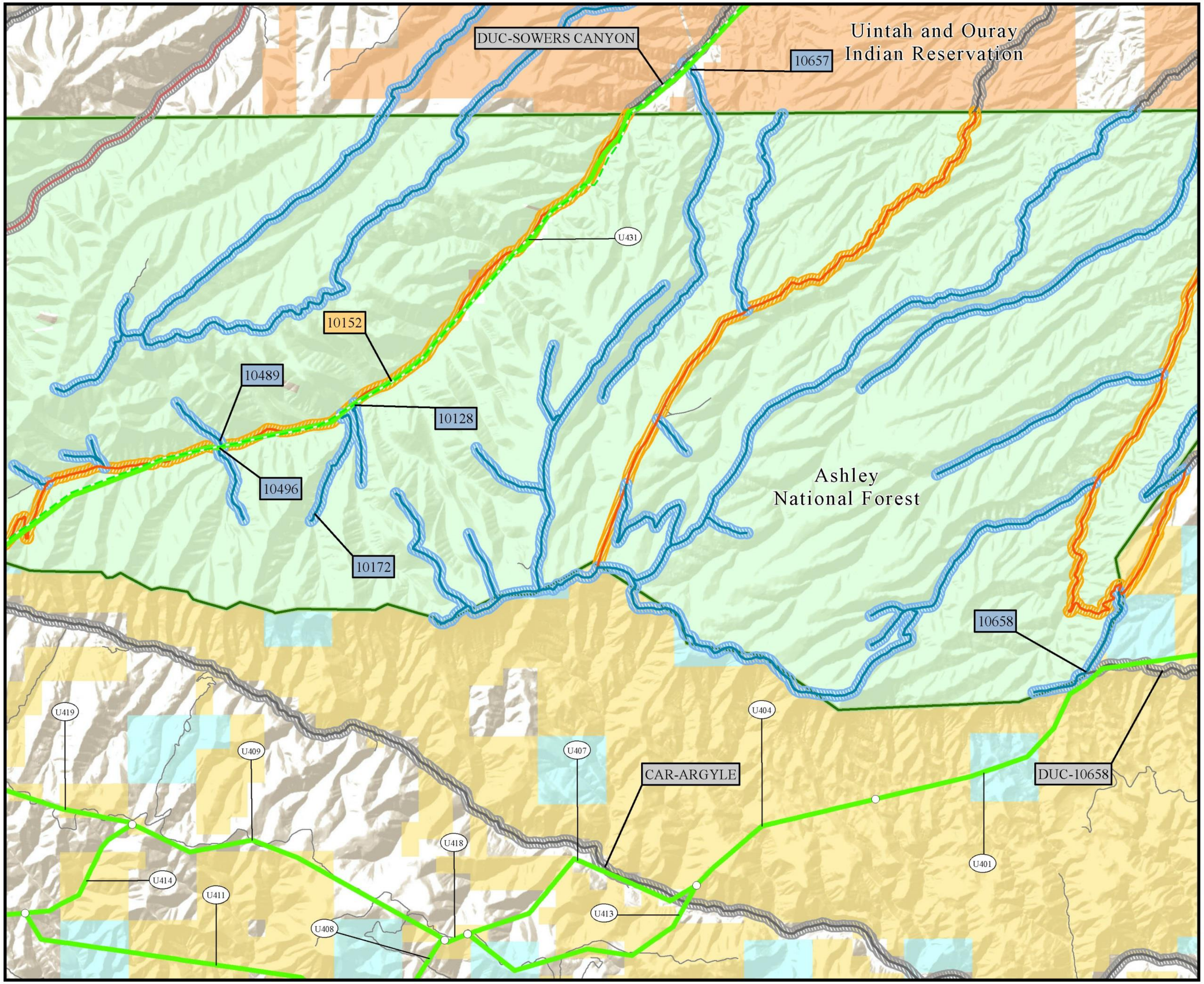

Map D-2a

Alternative Routes and Transportation within National Forests

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

U.S. Forest Service Roads[1]

Operating Maintenance	Objective[2]
— Basic Custodial Care (Closed)	▨ Basic Custodial Care (Closed)
— High Clearance Vehicles	▨ High Clearance Vehicles
— Suitable for Passenger Cars	▨ Suitable for Passenger Cars
— Moderate Degree of User Comfort	▨ Moderate Degree of User Comfort
— High Degree of User Comfort	▨ High Degree of User Comfort
— No Defined Operating Maintenance	▨ No Defined Objective
	▨ Decommission

Alternative Routes

— Alternative Route

Other Project Features

▭ Project Area Boundary	○ Link Node
⊙ Link Number	

Land Ownership

🟨 Bureau of Land Management	■ State Land
🟧 Indian Reservation	☐ Private Land
🟩 U.S. Forest Service	

General Reference

● City or Town	═ Interstate Highway
– – 345kV Transmission Line	— U.S. Highway
– – 138kV Transmission Line	— State Highway
┼┼ Railroad	— Other Road
	■ Lake or Reservoir
	☐ County Boundary
	☐ U.S. Forest Service Boundary

SOURCES:
USFS Roads, USFS 2013;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013;
U.S. Forest Service Boundary, USFS 2006

NOTES:
[1] Roads are labeled only if they are within 750 feet of the route centerline.
[2] U.S. Forest Service Road Objectives are buffered 800 feet on either side of road centerline for display purposes.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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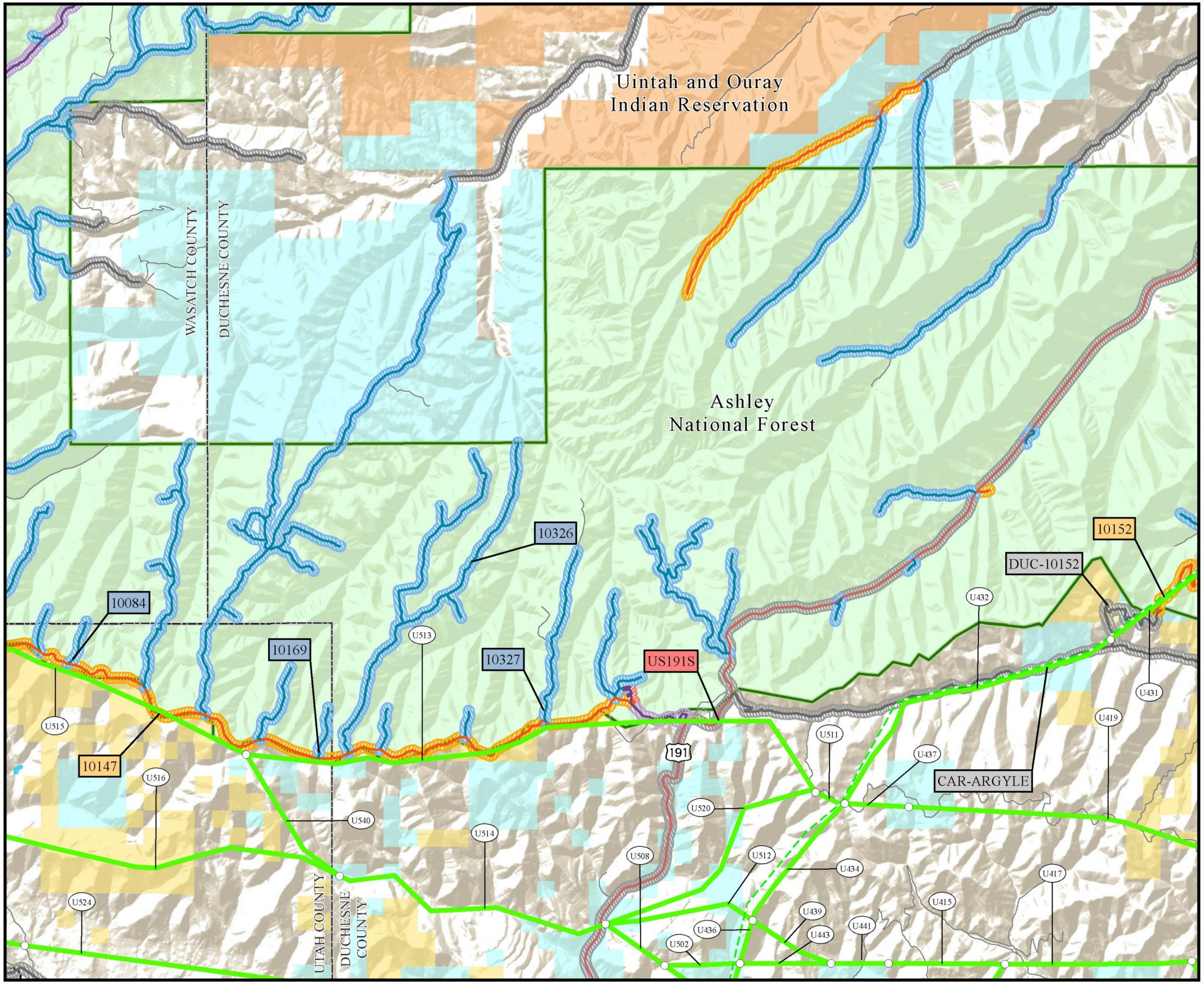

Map D-2b

Alternative Routes and Transportation within National Forests

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

U.S. Forest Service Roads[1]

Operating Maintenance	Objective[2]
Basic Custodial Care (Closed)	▨ Basic Custodial Care (Closed)
High Clearance Vehicles	▨ High Clearance Vehicles
Suitable for Passenger Cars	▨ Suitable for Passenger Cars
Moderate Degree of User Comfort	▨ Moderate Degree of User Comfort
High Degree of User Comfort	▨ High Degree of User Comfort
No Defined Operating Maintenance	▨ No Defined Objective
	▨ Decommission

Alternative Routes

Alternative Route

Other Project Features

Project Area Boundary
○ Link Node
Link Number

Land Ownership

Bureau of Land Management
Indian Reservation
U.S. Forest Service
State Land
Private Land

General Reference

● City or Town
345kV Transmission Line
138kV Transmission Line
Railroad
Interstate Highway
U.S. Highway
State Highway
Other Road
Lake or Reservoir
County Boundary
U.S. Forest Service Boundary

SOURCES:
USFS Roads, USFS 2013;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013;
U.S. Forest Service Boundary, USFS 2006

NOTES:
[1] Roads are labeled only if they are within 750 feet of the route centerline.
[2] U.S. Forest Service Road Objectives are buffered 800 feet on either side of road centerline for display purposes.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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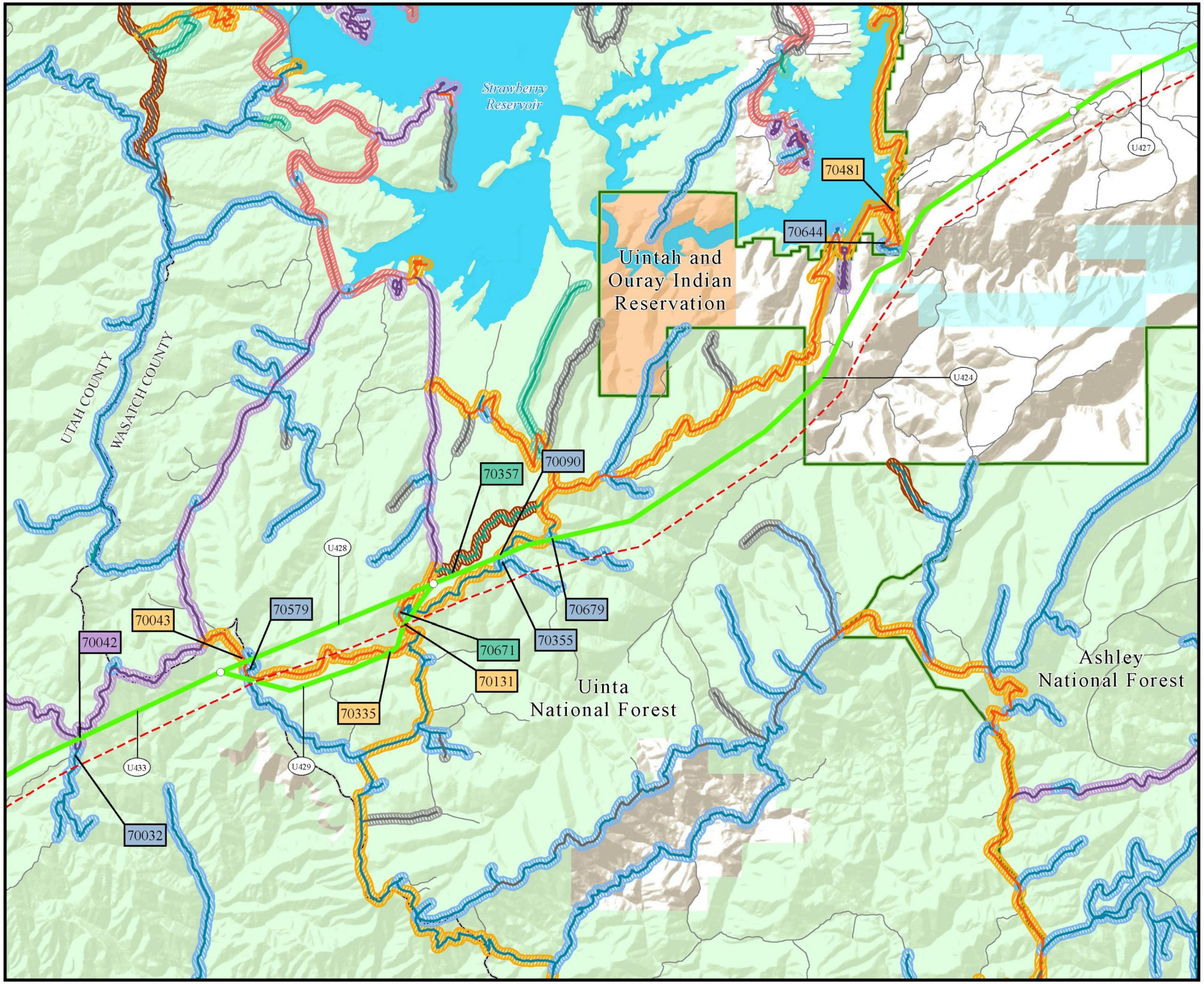

Map D-2c

Alternative Routes and Transportation within National Forests

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

U.S. Forest Service Roads[1]

Operating Maintenance
- Basic Custodial Care (Closed)
- High Clearance Vehicles
- Suitable for Passenger Cars
- Moderate Degree of User Comfort
- High Degree of User Comfort
- No Defined Operating Maintenance

Objective[2]
- Basic Custodial Care (Closed)
- High Clearance Vehicles
- Suitable for Passenger Cars
- Moderate Degree of User Comfort
- High Degree of User Comfort
- No Defined Objective
- Decommission

Alternative Routes
- Alternative Route

Other Project Features
- Project Area Boundary
- Link Node
- Link Number

Land Ownership
- Bureau of Land Management
- State Land
- Indian Reservation
- Private Land
- U.S. Forest Service

General Reference
- City or Town
- Interstate Highway
- 345kV Transmission Line
- U.S. Highway
- 138kV Transmission Line
- State Highway
- Railroad
- Other Road
- Lake or Reservoir
- County Boundary
- U.S. Forest Service Boundary

SOURCES:
USFS Roads, USFS 2013;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013;
U.S. Forest Service Boundary, USFS 2006

NOTES:
[1] Roads are labeled only if they are within 750 feet of the route centerline.
[2] U.S. Forest Service Road Objectives are buffered 800 feet on either side of road centerline for display purposes.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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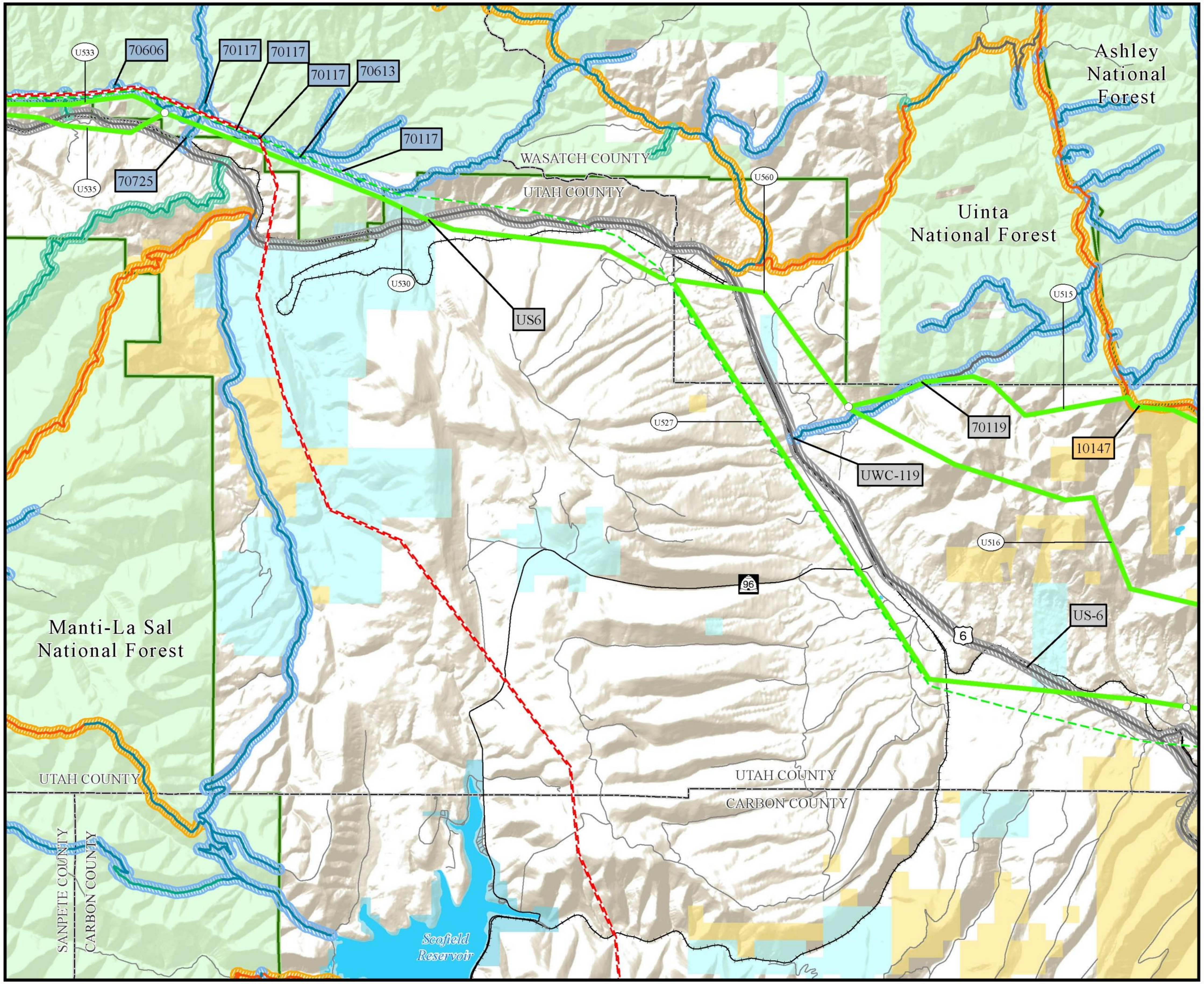

Map D-2d

Alternative Routes and Transportation within National Forests

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

U.S. Forest Service Roads[1]

Operating Maintenance	Objective[2]
Basic Custodial Care (Closed)	Basic Custodial Care (Closed)
High Clearance Vehicles	High Clearance Vehicles
Suitable for Passenger Cars	Suitable for Passenger Cars
Moderate Degree of User Comfort	Moderate Degree of User Comfort
High Degree of User Comfort	High Degree of User Comfort
No Defined Operating Maintenance	No Defined Objective
	Decommission

Alternative Routes

Alternative Route

Other Project Features

Project Area Boundary
Link Node
Link Number

Land Ownership

Bureau of Land Management
State Land
Indian Reservation
Private Land
U.S. Forest Service

General Reference

City or Town
Interstate Highway
345kV Transmission Line
U.S. Highway
138kV Transmission Line
State Highway
Railroad
Other Road
Lake or Reservoir
County Boundary
U.S. Forest Service Boundary

SOURCES:
USFS Roads, USFS 2013;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013;
U.S. Forest Service Boundary, USFS 2006

NOTES:
[1] Roads are labeled only if they are within 750 feet of the route centerline.
[2] U.S. Forest Service Road Objectives are buffered 800 feet on either side of road centerline for display purposes.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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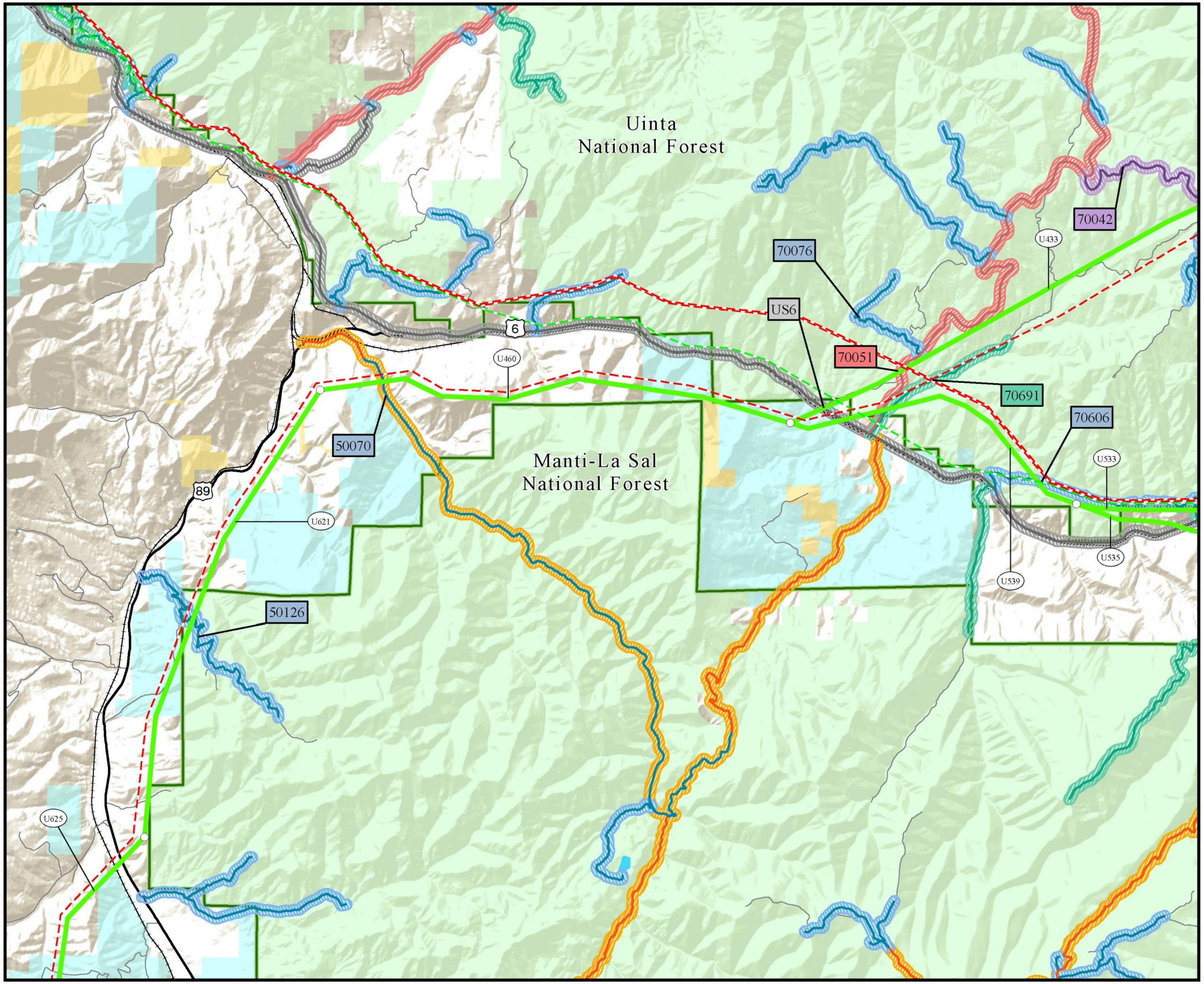

Map D-2e

Alternative Routes and Transportation within National Forests

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

SOURCES:
USFS Roads, USFS 2013;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013;
U.S. Forest Service Boundary, USFS 2006

NOTES:
[1] Roads are labeled only if they are within 750 feet of the route centerline.
[2] U.S. Forest Service Road Objectives are buffered 800 feet on either side of road centerline for display purposes.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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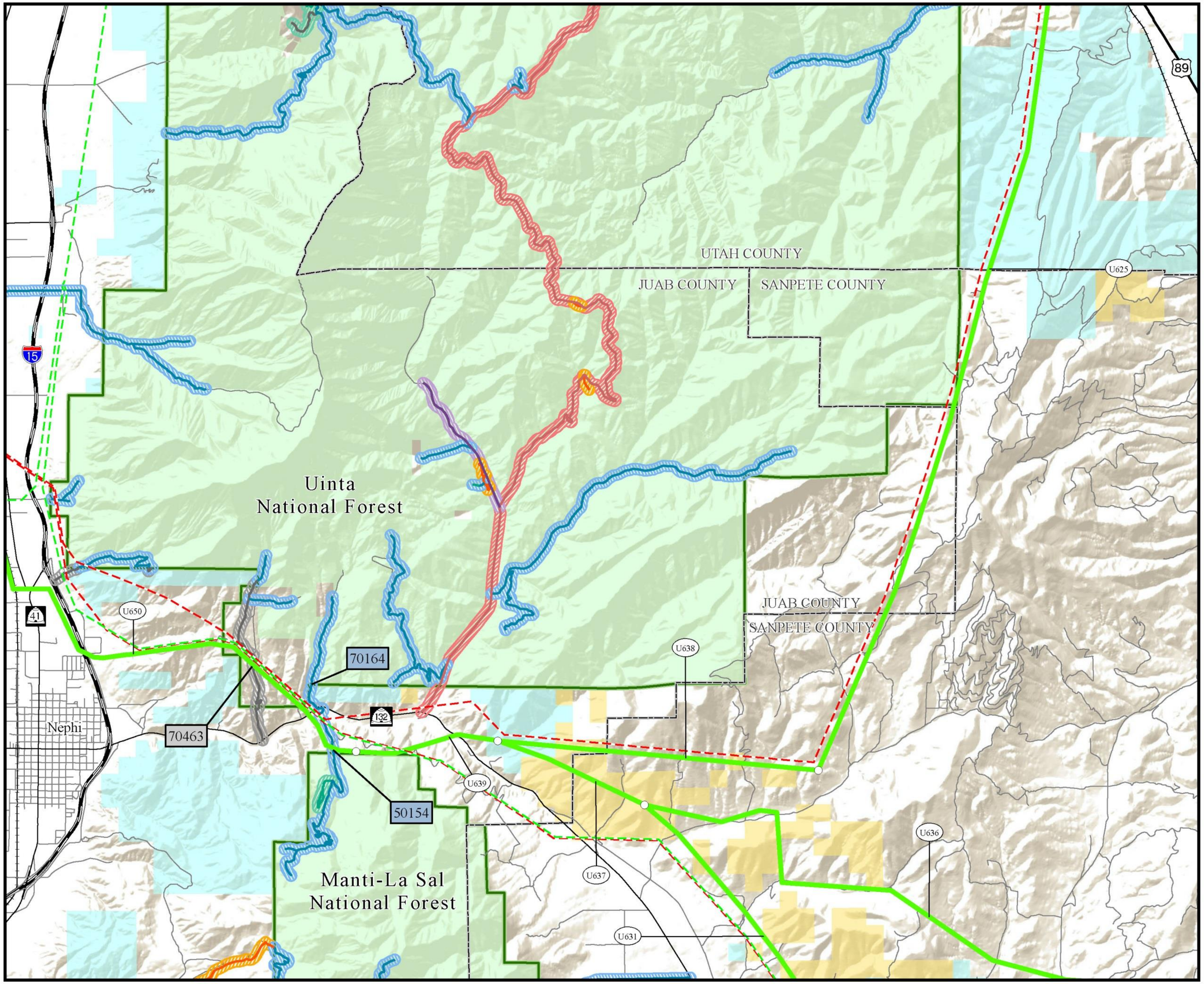

Map D-2f

Alternative Routes and Transportation within National Forests

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

U.S. Forest Service Roads[1]

Operating Maintenance	Objective[2]
Basic Custodial Care (Closed)	▨ Basic Custodial Care (Closed)
High Clearance Vehicles	▨ High Clearance Vehicles
Suitable for Passenger Cars	▨ Suitable for Passenger Cars
Moderate Degree of User Comfort	▨ Moderate Degree of User Comfort
High Degree of User Comfort	▨ High Degree of User Comfort
No Defined Operating Maintenance	▨ No Defined Objective
	▨ Decommission

Alternative Routes

Alternative Route

Other Project Features

Project Area Boundary
○ Link Node
Link Number

Land Ownership

Bureau of Land Management
State Land
Indian Reservation
Private Land
U.S. Forest Service

General Reference

● City or Town
Interstate Highway
345kV Transmission Line
U.S. Highway
138kV Transmission Line
State Highway
Railroad
Other Road
Lake or Reservoir
County Boundary
U.S. Forest Service Boundary

SOURCES:
USFS Roads, USFS 2013;
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013;
U.S. Forest Service Boundary, USFS 2006

NOTES:
[1] Roads are labeled only if they are within 750 feet of the route centerline.
[2] U.S. Forest Service Road Objectives are buffered 800 feet on either side of road centerline for display purposes.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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TABLE D-1 U.S. FOREST SERVICE ROADS IN ASHLEY NATIONAL FOREST INTERSECTING THE 750-FOOT BUFFER ROUTE					
Road Identification	**Name**	**Road Classification**	**Road Maintenance (Levels 1 through 5)**	**Road Objectives (Levels 1 through 5)**	**Surface Type**
Duc-10152		Existing			Native material
Duc-10658		Existing			Native material
10658	Bad Land Cliff Road	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
10489	Broad Hollow	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
10496	Corral Hollow	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
10169	County Line Road	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
10326	Fossil Ridge	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
10172	Lance Canyon	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
10084	Ostler Springs Ridge	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Native material
10147	Reservation Ridge	Existing	4 – moderate degree of user comfort	4 – moderate degree of user comfort	Native material
10128	Road Hollow	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
10152	Sowers Canyon	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Native material
10327	Tub Ridge	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material

TABLE D-2 U.S. FOREST SERVICE ROADS IN MANTI-LA SAL NATIONAL FOREST INTERSECTING THE 750-FOOT BUFFER ROUTE					
Road Identification	**Name**	**Road Classification**	**Road Maintenance (Levels 1 through 5)**	**Road Objectives (Levels 1 through 5)**	**Surface Type**
50126	Blind Canyon	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
52468	Booths Canyon	Existing	1 – basic custodial care (closed)	2 – high clearance vehicles	Native material
50040	Cottonwood	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel
7	Fairview – Huntington	Existing	4 – moderate degree of user comfort	4 – moderate degree of user comfort	Asphalt
50145	Flat Canyon	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
50145	Flat Canyon	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel
50014	Millers Flat	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel
50018	Monument Peak	Decommissioned	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel
53099	Obliterated 1991	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
50018	Potters Canyon	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel
53099	Rocky Ridge	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
50154	Skyline Drive	Existing	2 – high clearance vehicles	3 – suitable for passenger cars	Native material

TABLE D-2 U.S. FOREST SERVICE ROADS IN MANTI-LA SAL NATIONAL FOREST INTERSECTING THE 750-FOOT BUFFER ROUTE					
Road Identification	**Name**	**Road Classification**	**Road Maintenance (Levels 1 through 5)**	**Road Objectives (Levels 1 through 5)**	**Surface Type**
50154	Skyline Drive	Existing	4 – moderate degree of user comfort	4 – moderate degree of user comfort	Asphalt
50017	Spoon Creek	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel
45	SR264 – Eccles Hwy	Existing	4 – moderate degree of user comfort	4 – moderate degree of user comfort	Asphalt
50037	Straight Fork	Existing	2 – high clearance vehicles	3 – suitable for passenger cars	Native material
50228	Swens Canyon	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
50010	Un-Named	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
50218	Un-Named	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
51069	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
51184	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
51300	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
52208	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
52219	Un-Named	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
52220	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
52221	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
52222	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
52304	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
53019	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
53188	Un-Named	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
50016	Upper Joes Valley	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
50016	Upper Joes Valley	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material

TABLE D-3 U.S. FOREST SERVICE ROADS IN UINTA NATIONAL FOREST INTERSECTING THE 750-FOOT BUFFER ROUTE					
Road Identification	**Name**	**Road Classification**	**Road Maintenance (Levels 1 through 5)**	**Road Objectives (Levels 1 through 5)**	**Surface Type**
Uwc-119		Existing			Native material
70043	Bald Mountain	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70043	Bald Mountain	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Native material
70335	Buffalo Canyon	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel
70032	Corral Canyon	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70090	Devils Notch	Existing	2 – high clearance vehicles	3 – suitable for passenger cars	Native material
70090	Devils Notch	Existing	2 – high clearance vehicles	3 – suitable for passenger cars	Crushed aggregate or gravel
70671	Drill Hole	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
70117	Indian Creek	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70579	Little Baldy Dispersed	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70579	Little Baldy Dispersed	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70579	Little Baldy Dispersed	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70579	Little Baldy Dispersed	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70355	North Buffalo Canyon Ri*	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70644	North Willow Trail Road	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70691	Old Sheep Creek	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
70613	Right Fork Indian Creek	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70051	Sheep Creek – Rays Valley	Existing	5 – high degree of user comfort	5 – high degree of user comfort	Asphalt
70481	Soldier Creek Below Dam	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Native material
70679	South Center Overlook	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70119	Tabbyune	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70076	Tank Hollow	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material

TABLE D-3
U.S. FOREST SERVICE ROADS IN UINTA NATIONAL FOREST INTERSECTING THE 750-FOOT BUFFER ROUTE

Road Identification	Name	Road Classification	Road Maintenance (Levels 1 through 5)	Road Objectives (Levels 1 through 5)	Surface Type
70357	Trail Hollow-French Hol*	Decommissioned	1 – basic custodial care (closed)	Decommission	Native material
70042	Unicorn Ridge – Indian Creek	Existing	4 – moderate degree of user comfort	4 – moderate degree of user comfort	Crushed aggregate or gravel
70606	Utah Power-Light Span F*	Existing	2 – high clearance vehicles	2 – high clearance vehicles	Native material
70607	Utah Power-Light Spur	Existing	1 – basic custodial care (closed)	1 – basic custodial care (closed)	Native material
70131	West Side Strawberry	Existing	2 – high clearance vehicles	3 – suitable for passenger cars	Native material
70131	West Side Strawberry	Existing	3 – suitable for passenger cars	3 – suitable for passenger cars	Crushed aggregate or gravel

D.2 Selective Mitigation by U.S. Forest Service Management Areas

In accordance with practices prescribed for Pipelines, Transmission Facilities, and Rights-of-Way in the U.S. Department of Agriculture's *National Best Management Practices for Water Quality Management on National Forest System Land*s, site-specific best management practice prescriptions will be developed for the Project through the process of developing the POD. The POD will meet the USFS objective to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources during the construction and maintenance of the Project. Tables D-4 through D-6 summarize the management emphasis of management areas crossed by alternative routes. Tables D-7 through D-9 summarize extent of mitigation measures considered in the analysis for each management area by resource.

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TABLE D-4
MANAGEMENT AREAS CROSSED BY ALTERNATIVE ROUTES ON THE ASHLEY NATIONAL FOREST

Alternative Route	Relevant Forest Plan	Management Area	Management Emphasis
COUT-B, COUT-C (Camp Timberlane/ Argyle Canyon Variations 2 and 5)	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)	n – range of resource uses and outputs; commodity production modified for amenity production	Resource protection as needed. Access may be controlled to enhance wildlife habitat. Improvements allowed on low investment basis. Habitat diversity. No restrictions to mineral development other than standards and guidelines.
COUT-B, COUT-C (Camp Timberlane/ Argyle Canyon Variation 5)	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)	f – dispersed recreation roaded	Area receiving a variety of uses in a variety of landforms and vegetation types in a roaded environment. Dispersed recreation is favored over other resources. Improvements designed to enhance recreation opportunities and optimize species diversity. Construction allowed as needed. Maintenance at high levels on main roads. May have road closures to protect resources.
COUT-B, COUT-C (Camp Timberlane/ Argyle Canyon Variations 2 and 5)	Ashley National Forest, Land and Resource Management Plan and Final Environmental Impact Statement, 1986, as amended (U.S. Forest Service [USFS] 1986a)	d – high forage production and livestock utilization	Managed for livestock grazing. Open to all recreation uses and generally all travel. Other construction is permitted if conflicts with livestock grazing are mitigated. Riparian areas maintained to protect streambank stability.

TABLE D-5
MANAGEMENT AREAS CROSSED BY ALTERNATIVE ROUTES ON THE MANTI-LA SAL NATIONAL FOREST

Alternative Route	Relevant Forest Plan	Management Area	Management Emphasis
COUT-A, COUT-B, COUT-C, COUT BAX-B, COUT BAX-C, COUT-I	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (USFS 1986b)	General Big-Game Winter Range (GWR)	Management emphasis is focused on providing general big game winter range. These are areas wildlife traditionally use. Treatments of various types are applied to increase forage production and plant species composition. Investments in compatible resource activities may occur. Permanent roads and special uses may be permitted. Short-term or temporary roads are obliterated and rehabilitated within one year after intended use. Motorized use is managed as appropriate to prevent unacceptable stress on big-game animals during the primary use season. Specific cover opening ratios, opening width, and stand design are maintained in pinyon-juniper chaining areas.
COUT BAX-B, COUT BAX-C, COUT BAX-E, COUT-A, COUT-B, COUT-C, COUT-H, COUT-I	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (USFS 1986b)	Range Forage Production (RNG)	Emphasis is on production of forage and cover for domestic livestock and wildlife. Intensive grazing management systems are generally favored. Some periodic heavy forage utilization may occur. Opportunities for investments in structural and non-structural improvements to increase forage production is moderate to high. Investments are made in compatible resource activities. Dispersed recreation opportunities vary between semi-primitive non-motorized and roaded natural appearing. Management activities are evident, but harmonize with the natural setting.
COUT-A, COUT-B, COUT-C	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (USFS 1986b)	Key Big-Game Winter Range (KWR)	Management emphasis is focused on providing winter forage and cover for big-game species in areas that must be available and unencumbered for wildlife use each year during the critical winter period. Vegetative treatments are applied to increase forage production of grass, forb, and especially browse species and/or to create and maintain thermal and hiding cover. Conflicting uses are not permitted on a continuing basis, but may be permitted outside the critical season if there is no long-term degradation. New roads other than short-term (temporary) roads are located outside of the management unit. Short-term roads will be rehabilitated to provide for wildlife use within one season after completed use. Prohibit motorized use to prevent unacceptable stress on big game during critical use periods.

TABLE D-5
MANAGEMENT AREAS CROSSED BY ALTERNATIVE ROUTES ON THE MANTI-LA SAL NATIONAL FOREST

Alternative Route	Relevant Forest Plan	Management Area	Management Emphasis
COUT BAX-B, COUT BAX-C, COUT-I	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (USFS 1986b)	Minerals Management Area (MMA)	Management emphasis is on making land surface available for existing and potential major mineral developments. This prescription is applies where the lands surface is or will be used for facilities needed for the extraction of leasable minerals over an extended period. The areas associated with known, potential, development sites are included in this unit. Additional areas may be added to this unit as mines or fields are located and developed. As the developments are removed and restoration is completed, these areas may be changed to other appropriate management units. In units where mineral development is pending, renewable resource activities strive to be compatible with the management goals of adjacent management units. Long-term investments, such as timber planting, generally are not made. However, short-term investments, such as range and wildlife revegetation projects, may be made on these units.
COUT BAX-E, COUT-H	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (USFS 1986b)	Wood Fiber Production and Utilization (TBR)	Emphasis is on management for the production and use of wood-fiber for a variety of wood products. The harvest methods by Forest cover type are single tree and group selection and shelterwood in Englemann spruce-subalpine fire, Douglas-fire, ponderosa pine, mixed conifers, and clear cutting in aspen. Harvesting will be accomplished with methods including cable, conventional crawler tractor, or rubber-tired skidders. Pre-commercial thinning and intermediate harvest will be used to increase or maintain fiber production. Dispersed recreation opportunities vary between semi-primitive non-motorized and roaded natural appearing. Wildlife habitat diversity may be enhanced by vegetative manipulation. Livestock grazing may be permitted. This prescription could alter water yield through vegetation management, as well as decreased evapotranspiration and maximize snow retention in small openings on low energy slopes.
COUT BAX-B, COUT BAX-C, COUT-I	Manti-La Sal National Forest, Land and Resource Management Plan, 1986, as amended (USFS 1986b)	Utility Corridor (UCW)	Emphasis is on providing transportation corridors for major cross-country pipelines, electrical transmission lines, and telephone lines. Management activities in these linear corridors strive to be compatible with the management goals of the adjacent management units.

TABLE D-6 MANAGEMENT AREAS CROSSED BY ALTERNATIVE ROUTES ON THE UINTA NATIONAL FOREST			
Relevant Alternative Route(s)	**Relevant Forest Plan**	**Management Area**	**Management Emphasis**
COUT-A, COUT-B, COUT-C, COUT-C (Spanish Fork Canyon/U.S. Highway 6 Variation 1)	Uinta National Forest, Record for Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (U.S. Forest Service [USFS] 2003)	Upper Spanish Fork Canyon	Aquatic and terrestrial habitat areas are managed for quality habitat to contribute toward maintenance and/or recovery of plant and animal species. Resources are maintained or improved to achieve desired conditions for habitats of threatened, endangered, sensitive, and Management Indicator Species (MIS). Most, but not all, of the critical deer and elk winter range is included within this prescription. Vegetation management, including timber harvest, may be used to address vegetation needs for wildlife habitat, watershed improvement, and/or forest health needs. Additional motorized trails may be constructed. Grazing may be allowed with limitations based on the species for which a particular area is being managed (e.g., an area managed for greater sage grouse habitat will require different stubble heights than an area managed for winter range). No additional winter recreation facilities may be constructed in the areas of this prescription managed as Lynx Analysis Units. Features in utility corridor/communication site areas may include various non-recreation special uses such as utility corridors or communication sites allocated for long-term site investment. Vegetation management activities are generally limited to activities consistent with the installation and maintenance of the utility line or communication site and mitigation against potential erosion and visual quality impacts. Though not considered suitable for grazing, these sites are often unfenced and some grazing use may occur. Recreation use is limited to incidental dispersed use, such as a trail crossing through the area. The emphasis in dispersed recreation is on providing opportunities for and/or facilitating dispersed recreation. This management prescription includes areas of existing or anticipated concentrations of recreational use. Intensive vegetation management may be required to maintain desired conditions. Additional motorized trails may be constructed. Development is limited to a level that facilitates the dispersed recreation experience and addresses resource impacts.

TABLE D-6
MANAGEMENT AREAS CROSSED BY ALTERNATIVE ROUTES ON THE UINTA NATIONAL FOREST

Relevant Alternative Route(s)	Relevant Forest Plan	Management Area	Management Emphasis
All COUT BAX and COUT	Uinta National Forest, Record for Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (USFS 2003)	Nephi	Not applicable. The portion of the management areas where the alternative routes pass through Nephi does not have management emphasis areas identified.
COUT-A, COUT-A (Chipman Creek, Variation 1)	Uinta National Forest, Record for Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (USFS 2003)	Willow Creek	Aquatic and terrestrial habitat areas are managed for quality habitat to contribute toward maintenance and/or recovery of plant and animal species. Resources are maintained or improved to achieve desired conditions for habitats of threatened, endangered, sensitive, and MIS. Most, but not all, of the critical deer and elk winter range is included within this prescription. Vegetation management, including timber harvest, may be used to address vegetation needs for wildlife habitat, watershed improvement, and/or forest health needs. Additional motorized trails may be constructed. Grazing may be allowed with limitations based on the species for which a particular area is being managed (e.g., an area managed for greater sage grouse habitat will require different stubble heights than an area managed for winter range). No additional winter recreation facilities may be constructed in the areas of this prescription managed as Lynx Analysis Units. Features in utility corridor/communication site areas may include various non-recreation special uses such as utility corridors or communication sites allocated for long-term site investment. Vegetation management activities are generally limited to activities consistent with the installation and maintenance of the utility line or communication site and mitigation against potential erosion and visual quality impacts. Though not considered suitable for grazing, these sites are often unfenced and some grazing use may occur. Recreation use is limited to incidental dispersed use, such as a trail crossing through the area.

TABLE D-6
MANAGEMENT AREAS CROSSED BY ALTERNATIVE ROUTES ON THE UINTA NATIONAL FOREST

Relevant Alternative Route(s)	Relevant Forest Plan	Management Area	Management Emphasis
COUT-A	Uinta National Forest, Record for Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (USFS 2003)	Diamond Fork	The emphasis in this prescription is on providing opportunities for and/or facilitating dispersed recreation. This management prescription includes areas of existing or anticipated concentrations of recreational use. Intensive vegetation management may be required to maintain desired conditions. Additional motorized trails may be constructed. Development is limited to a level that facilitates the dispersed recreation experience and addresses resource impacts.
COUT-A, COUT-B, COUT-C	Uinta National Forest, Record for Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (USFS 2003)	Thistle	Emphasis is on maintaining or restoring vegetation to achieve multiple resource values for forested ecosystems – limited development. Additional motorized trails may be constructed. Management of forested ecosystems enhances wildlife habitats, improves watershed stability, and improves vegetative diversity. Management encompasses the full range of land and resource treatment activities. Additional motorized trails may be constructed. Grazing by livestock is allowed, but forage production for livestock use is limited to meet requirements for wildlife, riparian, water quality, or other objectives.
COUT-C (Camp Timberlane/Argyle Canyon (Variations 2 and 5)	Uinta National Forest, Record for Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (USFS 2003)	White River	Aquatic and terrestrial habitat areas are managed for quality habitat to contribute toward maintenance and/or recovery of plant and animal species. Resources are maintained or improved to achieve desired conditions for habitats of threatened, endangered, sensitive, and MIS. Most, but not all, of the critical deer and elk winter range is included within this prescription. Vegetation management, including timber harvest, may be used to address vegetation needs for wildlife habitat, watershed improvement, and/or forest health needs. Additional motorized trails may be constructed. Grazing may be allowed with limitations based on the species for which a particular area is being managed (e.g., an area managed for greater sage grouse habitat will require different stubble heights than an area managed for winter range). No additional winter recreation facilities may be constructed in the areas of this prescription managed as Lynx Analysis Units.

TABLE D-6
MANAGEMENT AREAS CROSSED BY ALTERNATIVE ROUTES ON THE UINTA NATIONAL FOREST

Relevant Alternative Route(s)	Relevant Forest Plan	Management Area	Management Emphasis
COUT-A (Chipman Creek, Variation 1)	Uinta National Forest, Record for Decision for the Final Environmental Impact Statement and Revised Land and Resource Management Plan, 2003, as amended (USFS 2003)	Strawberry Reservoir	Emphasis is on maintaining or restoring vegetation to achieve multiple resource values and provide for multiple uses for forested ecosystems – vegetation management. Management area direction also includes timber resource goals and objectives, but achievement of high yields is not the primary purpose. The Forest’s suitable timber base is located within this management prescription. Timber volumes harvested are applied to the Forest’s allowable sale quantity. Management encompasses the full range of activities and uses. Road densities and designs are compatible with multiple resource values. Additional motorized trails may be constructed. Recreation and other developments requiring the construction and reconstruction of roads and trails will be considered.

TABLE D-7
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE ASHLEY NATIONAL FOREST (ALTERNATIVE COUT-B)

Selective Mitigation Measure	Mitigation Description	Miles of Mitigation by Resource											
										Visual			
		Earth	Soils	Water	Vegetation	Special Status Plants	Wildlife	Special Status Wildlife	Land Use	Visual	High Concern	Moderate Concern	Scenery
Management Area f (Dispersed Recreation Roaded)													
1	Minimize/avoid disturbance to sensitive soils and vegetation	0.7											
2	Sensitive resources avoidance					0.7		0.6					
3	Minimize slope cut and fill	0.6							0.7	0.7	0.2	0.6	0.7
4	Minimize tree clearing							0.6	0.7	0.7	0.2	0.2	0.7
5	Minimize new or improved accessibility							0.6					
6	Tower design modification									0.2	0.2		0.2
7	Span and/or avoid sensitive features	0.7				0.7		0.6	0.1				
10	Helicopter-assisted construction								0.7				
12	Seasonal and spatial plant and wildlife restrictions						0.7	0.6					
15	Limit accessibility in sensitive habitats						0.7						
16	Blend road cuts or grading									0.3			0.3
Management Area n (Range of Resource Uses and Ouputs [commodity production modified for amenity production])													
1	Minimize/avoid disturbance to sensitive soils and vegetation	7.3	1.8	6.3	0.1								
2	Sensitive resources avoidance	6.3		6.3	0.1	7.6		0.2					
3	Minimize slope cut and fill	4.9							2.2	2.2			2.2
4	Minimize tree clearing				0.1			0.2	2.2	2.1			2.1
5	Minimize new or improved accessibility							0.2	1.1	0.4			0.4
7	Span and/or avoid sensitive features	7.9	2.2	6.3	0.1	7.6		0.2	8.2				
9	Maximize span at crossings								0.6				
10	Helicopter-assisted construction								2.2				
11	Minimize right-of-way clearing	6.3		6.3									
12	Seasonal and spatial plant and wildlife restrictions						9.1	0.2					
13	Overland access	0.4	0.4										
15	Limit accessibility in sensitive habitats						9.1						

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource									
			Earth	Soils	Water	Wildlife	Special Status Wildlife	Land Use	Visual			
									Visual	High Concern	Moderate Concern	Scenery
General Big Game Winter Range (GWR)												
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT BAX-B	0.3	0.1	0.3							
		COUT BAX-C	0.3	0.1	0.3							
		COUT-I	0.3	0.1	0.3							
2	Sensitive resources avoidance	COUT BAX-B	0.3		0.3							
		COUT BAX-C	0.3		0.3							
		COUT-I	0.3		0.3							
3	Minimize slope cut and fill	COUT BAX-B	0.4	0.1					0.8	0.8	0.1	0.8
		COUT BAX-C	0.4	0.1					0.8	0.8	0.1	0.8
		COUT-A	0.5					0.4	0.9	0.9	0.9	0.9
		COUT-B	0.5					0.4	0.9	0.9	0.9	0.9
		COUT-C	0.5					0.4	0.9	0.9	0.9	0.9
		COUT-I	0.4	0.1					0.8	0.8	0.1	0.8
4	Minimize tree clearing	COUT BAX-B							0.8	0.8	0.1	0.8
		COUT BAX-C							0.8	0.8	0.1	0.8
		COUT-A						0.4	0.9	0.9	0.9	0.9
		COUT-B						0.4	0.9	0.9	0.9	0.9
		COUT-C						0.4	0.9	0.9	0.9	0.9
		COUT-I							0.8	0.8	0.1	0.8
5	Minimize new or improved accessibility	COUT BAX-B							0.2	0.1		0.2
		COUT BAX-C							0.2	0.1		0.2
		COUT-A						0.1				
		COUT-B						0.1				
		COUT-C						0.1				
		COUT-I							0.2	0.1		0.2

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource									
			Earth	Soils	Water	Wildlife	Special Status Wildlife	Land Use	Visual			
									Visual	High Concern	Moderate Concern	Scenery
7	Span and/or avoid sensitive features	COUT BAX-B	0.4	0.2	0.3			0.8				
		COUT BAX-C	0.4	0.2	0.3			0.8				
		COUT-I	0.4	0.2	0.3			0.8				
8	Match transmission line spans	COUT-A							0.9	0.9		
		COUT-B							0.9	0.9		
		COUT-C							0.9	0.9		
9	Maximize span at crossings	COUT-A						0.1				
		COUT-B						0.1				
		COUT-C						0.1				
10	Helicopter-assisted construction	COUT-A						0.3				
		COUT-B						0.3				
		COUT-C						0.3				
11	Minimize right-of-way clearing	COUT BAX-B	0.3		0.3							
		COUT BAX-C	0.3		0.3							
		COUT-I	0.3		0.3							
12	Seasonal and spatial plant and wildlife restrictions	COUT BAX-B				0.8						
		COUT BAX-C				0.8						
		COUT-A				0.9						
		COUT-B				0.9						
		COUT-C				0.9						
		COUT-I				0.8						
13	Overland access	COUT BAX-B	0.1	0.1								
		COUT BAX-C	0.1	0.1								
		COUT-I	0.1	0.1								

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	**Mitigation Description**	**Alternative Route**	**Miles of Mitigation by Resource**									
									Visual			
			Earth	**Soils**	**Water**	**Wildlife**	**Special Status Wildlife**	**Land Use**	**Visual**	**High Concern**	**Moderate Concern**	**Scenery**
15	Limit accessibility in sensitive habitats	COUT BAX-B				0.8						
		COUT BAX-C				0.8						
		COUT-A				0.9						
		COUT-B				0.9						
		COUT-C				0.9						
		COUT-I				0.8						
16	Blend road cuts or grading	COUT BAX-B							0.8		0.8	
		COUT BAX-C							0.8		0.8	
		COUT-I							0.8		0.8	
Range Forage Production (RNG)												
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT BAX-B	0.5	1.7	1.8							
		COUT BAX-C	0.5	1.7	1.8							
		COUT BAX-E		0.1	1.8							
		COUT-H		0.1	1.8							
		COUT-I	0.5	1.7	1.8							
2	Sensitive resources avoidance	COUT BAX-B	1.8		1.8							
		COUT BAX-C	1.8		1.8							
		COUT BAX-E	1.8		1.8							
		COUT-H	1.8		1.8							
		COUT-I	1.8		1.8							
3	Minimize slope cut and fill	COUT BAX-B	15.0	2.7					13.1	12.1	3.8	13.1
		COUT BAX-C	15.0	2.7					13.1	12.1	3.8	13.1
		COUT BAX-E	3.9	0.1				1.6	6.3	5.2	3.9	6.3
		COUT-H	3.9	0.1				1.6	6.3	5.2	3.9	6.3
		COUT-I	15.0	2.7					13.1	12.1	3.8	13.1

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource									
									Visual			
			Earth	Soils	Water	Wildlife	Special Status Wildlife	Land Use	Visual	High Concern	Moderate Concern	Scenery
4	Minimize tree clearing	COUT BAX-B						0.2	12.0	11.0	2.6	12.0
		COUT BAX-C						0.2	12.0	11.0	2.6	12.0
		COUT BAX-E						1.6	4.8	3.7	3.6	4.8
		COUT-H						1.6	12.0	3.7	3.6	4.8
		COUT-I						0.2	4.8	11.0	2.6	12.0
5	Minimize new or improved accessibility	COUT BAX-B					5.4	0.6	7.9	6.4	0.3	7.2
		COUT BAX-C					5.4	0.6	7.9	6.4	0.3	7.2
		COUT BAX-E					1.9	2.2	2.8	2.4	0.9	2.8
		COUT-H					1.9	2.2	2.8	2.4	0.9	2.8
		COUT-I					5.4	0.6	7.9	6.4	0.3	7.2
6	Tower design modifications	COUT BAX-B							11.6	11.6		
		COUT BAX-C							11.6	11.6		
		COUT-I							11.6	11.6		
7	Span and/or avoid sensitive features	COUT BAX-B	5.7	1.1	1.8			13.8	3.1	3.1		
		COUT BAX-C	5.7	1.1	1.8			13.8	3.1	3.1		
		COUT BAX-E	2.9	0.2	1.8			3.7				
		COUT-H	2.9	0.2	1.8			3.7				
		COUT-I	5.7	4.4	1.8			13.8	3.1	3.1		
9	Maximize span at crossings	COUT BAX-B						0.6	1.4	1.4		
		COUT BAX-C						0.6	1.4	1.4		
		COUT BAX-E						0.8	1.2	1.2		
		COUT-H						0.8	1.2	1.2		
		COUT-I						0.6	1.4	1.4		

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource									
									Visual			
			Earth	Soils	Water	Wildlife	Special Status Wildlife	Land Use	Visual	High Concern	Moderate Concern	Scenery
11	Minimize right-of-way clearing	COUT BAX-B	1.8		1.8							
		COUT BAX-C	1.8		1.8							
		COUT BAX-E	1.8		1.8							
		COUT-H	1.8		1.8							
		COUT-I	1.8		1.8							
12	Seasonal and spatial plant and wildlife restrictions	COUT BAX-B				15.0	5.4					
		COUT BAX-C				15.0	5.4					
		COUT BAX-E				6.8	1.9					
		COUT-H				6.8	1.9					
		COUT-I				15.0	5.4					
13	Overland access	COUT BAX-B	2.7	2.7			5.4					
		COUT BAX-C	2.7	2.7			5.4					
		COUT BAX-E	0.1	0.1			1.9					
		COUT-H	0.1	0.1			1.9					
		COUT-I	2.7	2.7			5.4					
15	Limit accessibility in sensitive habitats	COUT BAX-B				15.0						
		COUT BAX-C				15.0						
		COUT BAX-E				6.8						
		COUT-H				6.8						
		COUT-I				15.0						
16	Blend road cuts or grading	COUT BAX-B							3.0			3.0
		COUT BAX-C							3.0			3.0
		COUT-I							3.0			3.0
Minerals Management Area (MMA)												
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT BAX-B	0.6	0.4	0.3							
		COUT BAX-C	0.6	0.4	0.3							
		COUT-I	0.6	0.4	0.3							

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource									
									Visual			
			Earth	Soils	Water	Wildlife	Special Status Wildlife	Land Use	Visual	High Concern	Moderate Concern	Scenery
2	Sensitive resources avoidance	COUT BAX-B	0.6		0.3							
		COUT BAX-C	0.6		0.3							
		COUT-I	0.6		0.3							
3	Minimize slope cut and fill	COUT BAX-B	0.7						0.4	0.4	0.4	
		COUT BAX-C	0.7						0.4	0.4	0.4	
		COUT-I	0.7						0.4	0.4	0.4	
4	Minimize tree clearing	COUT BAX-B							0.4	0.4	0.4	
		COUT BAX-C							0.4	0.4	0.4	
		COUT-I							0.4	0.4	0.4	
6	Tower design modifications	COUT BAX-B							0.4	0.4		
		COUT BAX-C							0.4	0.4		
		COUT-I							0.4	0.4		
7	Span and/or avoid sensitive features	COUT BAX-B	0.6	0.4	0.3			0.4				
		COUT BAX-C	0.6	0.4	0.3			0.4				
		COUT-I	0.6	0.4	0.3			0.4				
11	Minimize right-of-way clearing	COUT BAX-B	0.6		0.3							
		COUT BAX-C	0.6		0.3							
		COUT-I	0.6		0.3							
13	Overland access	COUT BAX-B	0.1									
		COUT BAX-C	0.1									
		COUT-I	0.1									
12	Seasonal and spatial plant and wildlife restrictions	COUT BAX-B				0.4						
		COUT BAX-C				0.4						
		COUT-I				0.4						
15	Limit accessibility in sensitive habitats	COUT BAX-B				0.4						
		COUT BAX-C				0.4						
		COUT-I				0.4						

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource									
									Visual			
			Earth	Soils	Water	Wildlife	Special Status Wildlife	Land Use	Visual	High Concern	Moderate Concern	Scenery
Wood Fiber Production and Utilization (TBR)												
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT BAX-E	0.1		0.1							
		COUT-H	0.1		0.1							
2	Sensitive resources avoidance	COUT BAX-E	0.1		0.1							
		COUT-H	0.1		0.1							
3	Minimize slope cut and fill	COUT BAX-E	0.5						0.8	0.7	0.8	0.8
		COUT-H	0.5						0.8	0.7	0.8	0.8
4	Minimize tree clearing	COUT BAX-E	0.5						0.8	0.7	0.8	0.8
		COUT-H	0.5						0.8	0.7	0.8	0.8
5	Minimize new or improved accessibility	COUT BAX-E	0.5						0.7	0.7	0.4	0.7
		COUT-H	0.5						0.7	0.7	0.4	0.7
7	Span and/or avoid sensitive features	COUT BAX-E	0.8		0.1			0.8				
		COUT-H	0.8		0.1			0.8				
11	Minimize right-of-way clearing	COUT BAX-E	0.1		0.1							
		COUT-H	0.1		0.1							
12	Seasonal and spatial plant and wildlife restrictions	COUT BAX-E				0.8						
		COUT-H				0.8						
15	Limit accessibility in sensitive habitats	COUT BAX-E				0.8						
		COUT-H				0.8						
Utility Corridor (UCW)												
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT BAX-B	0.1		0.1							
		COUT BAX-C	0.1		0.1							
		COUT-I	0.1		0.1							
2	Sensitive resources avoidance	COUT BAX-B	0.1		0.1							
		COUT BAX-C	0.1		0.1							
		COUT-I	0.1		0.1							

TABLE D-8
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE MANTI-LA SAL NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource									
									Visual			
			Earth	Soils	Water	Wildlife	Special Status Wildlife	Land Use	Visual	High Concern	Moderate Concern	Scenery
3	Minimize slope cut and fill	COUT BAX-B	0.1									
		COUT BAX-C	0.1									
		COUT-I	0.1									
4	Minimize tree clearing	COUT BAX-B						0.1	0.1	0.1		0.1
		COUT BAX-C						0.1	0.1	0.1		0.1
		COUT-I						0.1	0.1	0.1		0.1
5	Minimize new or improved accessibility	COUT BAX-B					0.1					
		COUT BAX-C					0.1					
		COUT-I					0.1					
6	Tower design modifications	COUT BAX-B							0.1	0.1		
		COUT BAX-C							0.1	0.1		
		COUT-I							0.1	0.1		
7	Span and/or avoid sensitive features	COUT BAX-B	0.1		0.1			0.1				
		COUT BAX-C	0.1		0.1			0.1				
		COUT-I	0.1		0.1			0.1				
11	Minimize right-of-way clearing	COUT BAX-B	0.1		0.1							
		COUT BAX-C	0.1		0.1							
		COUT-I	0.1		0.1							
12	Seasonal and spatial plant and wildlife restrictions	COUT BAX-B				0.1	0.1					
		COUT BAX-C				0.1	0.1					
		COUT-I				0.1	0.1					
13	Overland access	COUT BAX-B					0.1					
		COUT BAX-C					0.1					
		COUT-I					0.1					
15	Limit accessibility in sensitive habitats	COUT BAX-B				0.1						
		COUT BAX-C				0.1						
		COUT-I				0.1						

TABLE D-9
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE UINTA NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource										
										Visual			
			Earth	**Soils**	**Water**	**Vegetation**	**Special Status Plants**	**Wildlife**	**Land Use**	**VisualVisual**	**High Concern**	**Moderate Concern**	**Scenery**
Upper Spanish Fork Canyon													
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT-A	5.1	2.2	3.2								
		COUT-B	7.0	6.2	2.1								
		COUT-C	7.0	6.2	2.1								
2	Sensitive resources avoidance	COUT-A	3.2		3.2		0.1						
		COUT-B	2.1		2.1								
		COUT-C	2.1		2.1								
3	Minimize slope cut and fill	COUT-A	5.2	4.9			0.1			7.2	4.2	4.8	7.2
		COUT-B	3.4	1.3						7.0	4.6	4.2	7.0
		COUT-C	3.4	1.3						7.0	4.6	4.2	7.0
4	Minimize tree clearing	COUT-A								7.8	4.8	4.8	7.8
		COUT-B								7.0	4.6	4.2	7.0
		COUT-C								7.0	4.6	4.2	7.0
5	Minimize new or improved accessibility	COUT-A							0.7	2.3	2.0	2.2	2.3
		COUT-B							0.4				
		COUT-C							0.4				
7	Span and/or avoid sensitive features	COUT-A	7.6	7.1	3.2		0.7						
		COUT-B	7.9	7.5	2.1				0.3				
		COUT-C	7.9	7.5	2.1				0.3				
8	Match transmission line spans	COUT-A								0.1		0.1	
		COUT-B								1.3	1.0	1.2	
		COUT-C								1.3	1.0	1.2	
9	Maximize span at crossings	COUT-A							0.7	0.4	0.4		
		COUT-B							0.4	0.5	0.4		0.4
		COUT-C							0.4	0.5	0.4		0.4

TABLE D-9
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE UINTA NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource										
										Visual			
			Earth	Soils	Water	Vegetation	Special Status Plants	Wildlife	Land Use	VisualVisual	High Concern	Moderate Concern	Scenery
11	Minimize right-of-way clearing	COUT-A	3.2		3.2								
		COUT-B	2.1		2.1								
		COUT-C	2.1		2.1								
12	Seasonal and spatial plant and wildlife restrictions	COUT-A						8.6					
		COUT-B						8.7					
		COUT-C						8.7					
13	Overland access	COUT-A	4.9	4.9									
		COUT-B	1.3	1.3									
		COUT-C	1.3	1.3									
15	Limit accessibility in sensitive habitats	COUT-A						8.6					
		COUT-B						8.7					
		COUT-C						8.7					
16	Blend road cuts or grading	COUT-B								1.1		1.1	1.0
		COUT-C								1.1		1.1	1.0
Nephi													
1	Minimize/avoid disturbance to sensitive soils and vegetation	All COUT BAX and COUT	0.8	0.3	0.7	0.1							
2	Sensitive resources avoidance	All COUT BAX and COUT	0.7		0.7	0.1							
3	Minimize slope cut and fill	All COUT BAX and COUT	0.6										
4	Minimize tree clearing	All COUT BAX and COUT				0.1							
7	Span and/or avoid sensitive features	All COUT BAX and COUT	0.8	0.3	0.7	0.1			0.4				
11	Minimize right-of-way clearing	All COUT BAX and COUT	0.7		0.7				0.7				

TABLE D-9
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE UINTA NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource										
										Visual			
			Earth	Soils	Water	Vegetation	Special Status Plants	Wildlife	Land Use	VisualVisual	High Concern	Moderate Concern	Scenery
12	Seasonal and spatial plant and wildlife restrictions	All COUT BAX and COUT						1.5					
15	Limit accessibility in sensitive habitats	All COUT BAX and COUT						1.5					
Willow Creek													
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT-A	3.0	1.7	1.8	0.8							
2	Sensitive resources avoidance	COUT-A	1.8		1.8	0.8							
3	Minimize slope cut and fill	COUT-A	4.6	2.1					0.2	7.0	1.7	5.8	7.0
4	Minimize tree clearing	COUT-A				0.8			0.2	7.5	1.8	6.3	7.5
5	Minimize new or improved accessibility	COUT-A							1.1	3.5		1.9	3.5
7	Span and/or avoid sensitive features	COUT-A	4.4	3.8	1.8	0.8							
9	Maximize span at crossings	COUT-A							1.1	0.4	0.4		
11	Minimize right-of-way clearing	COUT-A	1.8		1.8								
12	Seasonal and spatial plant and wildlife restrictions	COUT-A						7.8					
13	Overland access	COUT-A	2.1	2.1									
15	Limit accessibility in sensitive habitats	COUT-A						7.8					
Diamond Fork													
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT-A	0.2	0.2									
3	Minimize slope cut and fill	COUT-A								0.2	0.2	0.2	0.2
4	Minimize tree clearing	COUT-A								0.2	0.2	0.2	0.2

TABLE D-9
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE UINTA NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource										
										Visual			
			Earth	Soils	Water	Vegetation	Special Status Plants	Wildlife	Land Use	VisualVisual	High Concern	Moderate Concern	Scenery
5	Minimize new or improved accessibility	COUT-A							0.1				
7	Span and/or avoid sensitive features	COUT-A	0.2	0.2									
9	Maximize span at crossings	COUT-A							0.1				
12	Seasonal and spatial plant and wildlife restrictions	COUT-A						0.2					
15	Limit accessibility in sensitive habitats	COUT-A						0.2					
Thistle													
3	Minimize slope cut and fill	COUT-A								0.2			0.2
		COUT-B								0.2			0.2
		COUT-C								0.2			0.2
4	Minimize tree clearing	COUT-A								0.2			0.2
		COUT-B								0.2			0.2
		COUT-C								0.2			0.2
12	Seasonal and spatial plant and wildlife restrictions	COUT-A						1.8					
		COUT-B						0.2					
		COUT-C						0.2					
15	Limit accessibility in sensitive habitats	COUT-A						0.2					
		COUT-B						0.2					
		COUT-C						0.2					
Strawberry Reservoir													
1	Minimize/avoid disturbance to sensitive soils and vegetation	COUT-A	0.6	0.6		0.4							
2	Sensitive resources avoidance	COUT-A				0.4							
3	Minimize slope cut and fill	COUT-A	0.8							1.8	1.8	1.5	1.8

TABLE D-9
SUMMARY OF SELECTIVE MITIGATION MEASURES CONSIDERED ON THE UINTA NATIONAL FOREST BY RESOURCE AND MANAGEMENT AREA

Selective Mitigation Measure	Mitigation Description	Alternative Route	Miles of Mitigation by Resource										
										Visual			
			Earth	Soils	Water	Vegetation	Special Status Plants	Wildlife	Land Use	VisualVisual	High Concern	Moderate Concern	Scenery
4	Minimize tree clearing	COUT-A				0.4				1.8	1.8	1.5	1.8
5	Minimize new or improved accessibility	COUT-A							0.1				
7	Span and/or avoid sensitive features	COUT-A	0.7	0.6		0.4							
9	Maximize span at crossings	COUT-A							0.1				
12	Seasonal and spatial plant and wildlife restrictions	COUT-A						1.8					
15	Limit accessibility in sensitive habitats	COUT-A						1.8					

Appendix E
Bureau of Land Management Mitigation Guidance

APPENDIX E – BUREAU OF LAND MANAGEMENT MITIGATION GUIDANCE

Mitigation

The Bureau of Land Management (BLM) may require mitigation measures and conservation actions to achieve land-use plan goals and objectives and provide for sustained yield of natural resources on public lands, while continuing to honor the agency's multiple-use missions. The sequence of mitigation action would be the mitigation hierarchy (avoid, minimize, rectify, reduce or eliminate over time, compensate) as identified by the White House Council on Environmental Quality (40 Code of Federal Regulations 1508.20) and BLM's *Draft - Regional Mitigation* Manual Section 1794. Certain alternatives also may identify compensatory mitigation requirements for those implementation level activities whose impacts the agency(s) cannot adequately avoid, minimize, rectify, reduce, or eliminate over time (i.e., residual impacts).

The priority is to mitigate impacts at the site of the activity in conformance with the land-use plan goals and objectives through impact avoidance, minimization, rectification, and reduction over time of the impact, including those measures described in laws, regulations, policies, and land-use plans. When these types of mitigation measures are not sufficient to ameliorate anticipated direct, indirect, and cumulative impacts and substantial or significant residual impacts remain, additional measures to reduce these residual impacts to meet applicable land-use plan goals and objectives would be required (compensatory mitigation).

The Project would apply the mitigation hierarchy and would identify or incorporate by reference applicable land-use plan mitigation measures for:

- Avoiding
    - Identification of avoidance areas and/or measures (e.g., right-of-way avoidance areas, no surface occupancy areas) already included in laws, regulations, and/or governmental decision documents (e.g., BLM resource management plans [RMPs], state, tribal, or county plans that govern site or permit authorizations)
    - Identification of additional avoidance measures for the BLM to consider (e.g., additional avoidance best management practices)
- Minimizing
    - Identification of minimization measures (e.g., surface-use controls, conservation measures, best management practices) already included in BLM decision documents (e.g., RMPs; U. S. Fish and Wildlife Service Biological Opinions, other Project decision documents and right-of-way authorizations)
    - Identification of additional minimization measures for the BLM to consider (e.g., Applicant-committed design features)
- Rectifying
    - Identification of measures for the BLM to consider, including repairing, rehabilitating, or restoring affected landscapes
- Reducing or eliminating
    - Identification of measures for the BLM to consider for reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- Compensating
    - Identification of measures for the BLM to consider for compensating for the impact by replacing or providing substitute resources or environments

When applying mitigation at any level of the mitigation hierarchy, there would be requirements for monitoring the effectiveness of the mitigation as well as the durability of the mitigation. This monitoring is necessary, especially in relation to durability for compensatory mitigation to identify when it may be appropriate to consider applying adaptive management concepts to ensure continued durability for the life of the Project.

Two important concepts related to durability are (1) ecological durability, the length of time the benefits from mitigation measures persist on and influence the landscape and meet or exceed the length of time that projected impacts would affect resources and (2) protective durability, ecological values in compensatory mitigation Project areas that are unaffected by future and conflicting land-uses or disturbances.

The ecological durability of compensatory mitigation is greatest if the projects are large enough or properly located so they would, either in themselves or in conjunction with other projects, adjacent landscape conditions, or climate change predictions, provide the targeted conservation benefits.

Ecological durability may be compromised when the benefits of compensatory mitigation do not persist for the full duration of the impact intended to be offset (i.e., from initial surface disturbance to final reclamation, rehabilitation, or restoration). Damage to functioning compensatory mitigation measures may be caused by natural disturbances (such as wildfire) or anthropogenic disturbances (such as other authorized development), which shorten the intended duration of applicable mitigation.

The BLM would require that mitigation measures have a degree of protective durability. Financial protections (e.g., bonding for construction, endowment for mitigation management) are an important tool to achieve protective durability. The BLM would expressly condition its approval of the Project on the Applicant’s commitment to perform or cover the costs of mitigation, both onsite and outside the area of impact.

Examples of compensatory mitigation include creation or restoration of wetlands; offsite vegetation treatments to improve sage-grouse or migratory bird habitat; purchase of property or conservation easements to provide long-term protection for sage-grouse or migratory bird habitats; or appropriate mitigation for impacts to designated National Scenic and/or Historic Trails or those trails recommended as suitable for congressional designation.

Appendix F
Alternative Route Variations

APPENDIX F – ALTERNATIVE ROUTE VARIATIONS

F.1 Introduction

In the Draft Environmental Impact Statement (EIS), several of the alternative routes exhibited one or more route variations to compare shorter, local segments of routing options along the alternative routes. Based on comments received on the Draft EIS, including requests for analysis of additional local route variations along the route of Alternative WYCO-B and Alternative COUT-C (the Agency Preferred Alternative routes in the northern and southern segments, respectively), the added complexity of the routes necessitated a different presentation in the Final EIS. Therefore, the Final EIS has been restructured from the Draft EIS to focus on complete alternative routes in the body of the Final EIS and focus on the local route variations in this appendix. Chapter 2 explains and describes the comparison of the complete alternative routes, Chapters 3 and 4 describe the affected environment and environmental consequences associated with the complete alternative routes. The local route variations along the route of Alternative WYCO-B and Alternative COUT-C (the Agency Preferred Alternative routes in the northern and southern segments, respectively) are the focus of this appendix, which documents the analysis and comparison of the route variations. The methodology for comparing and analyzing the local route variations is the same as described in Chapters 2, 3, and 4.

All of the alternative route variations are displayed along their respective alternative routes on Map F-1 (Alternative Route Variation Overview). This appendix has been organized into seven sections by the following alternative route variation areas:

- Little Snake River crossing
- Deerlodge Road Area (entrance to Dinosaur National Monument)
- Colorado-Utah border area
- Argyle Ridge
- Camp Timberlane/Argyle Canyon
- Spanish Fork Canyon/U.S. Highway 6
- Chipman Creek area, Uinta National Forest

Each area of alternative route variation includes a narrative describing the background and rationale for analyzing the variation; a geographic description; a summary of critical resource issues; a map displaying the alternative route and variation(s); a summary table describing the substantive issues for each resource on the alternative route and variation(s); and tables, by resource, describing the inventory, impacts, and plan compliance with the same type of information as presented in Chapters 3 and 4. Note that grazing allotment information for the alternative route variations is presented in Appendix L.

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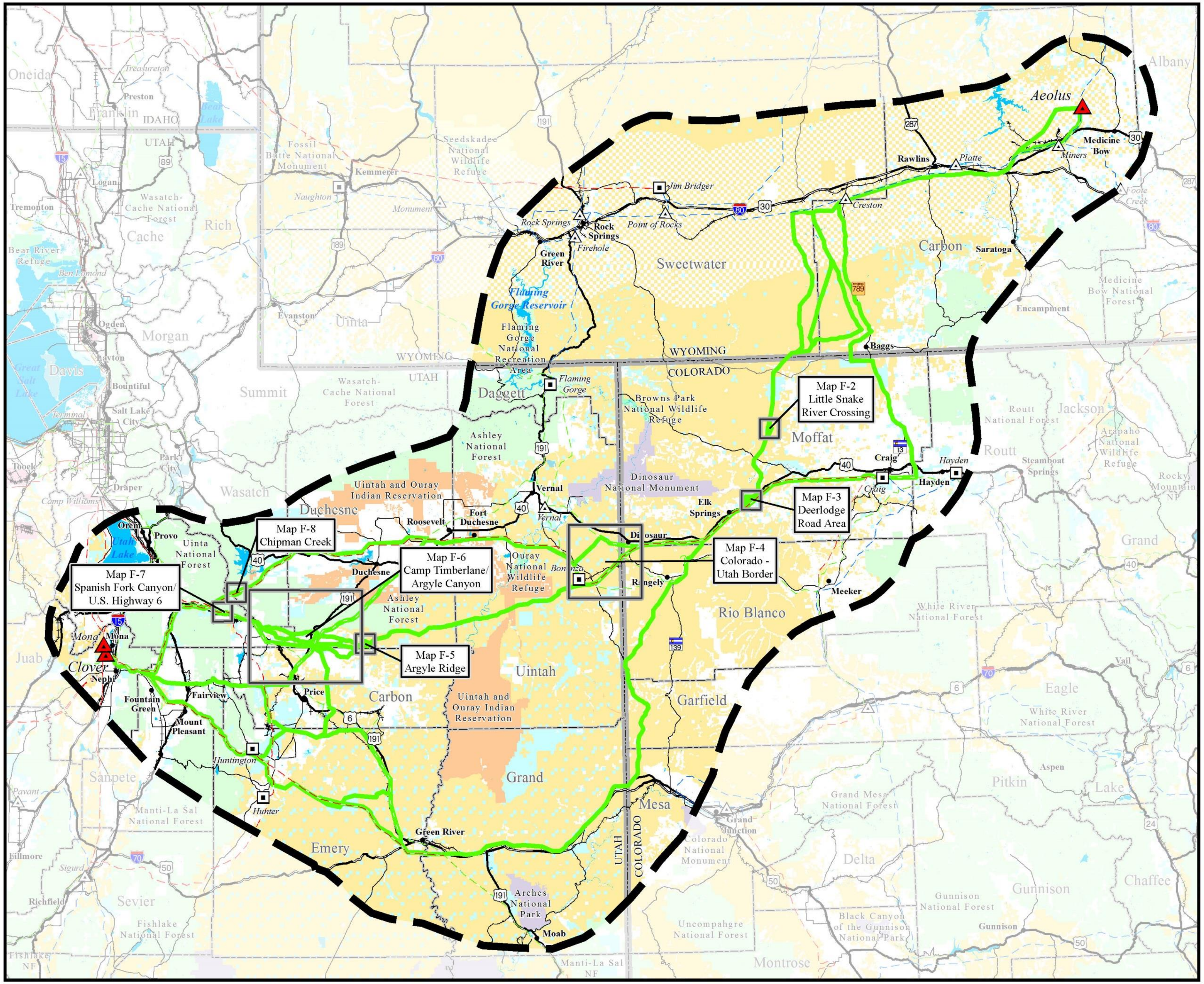

Map F-1
Route Variation Overview

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Alternative Route

- 🟩 Alternative Route

Project Features

- Project Area Boundary
- ▲ Substation (Project Terminal)

Land Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Indian Reservation
- National Park Service
- U.S. Department of Defense
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- State Land
- Private Land

General Reference

- Map
- City or Town
- Substation
- Power Plant
- 500kV Transmission Line
- 345kV Transmission Line
- 230kV Transmission Line
- 138kV Transmission Line
- Railroad
- Interstate Highway
- U.S. Highway
- State Highway
- Other Road
- Lake or Reservoir
- State Boundary
- County Boundary

SOURCES:
Land Jurisdiction, BLM 2013; City or Town, ESRI 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads, and Railroads, ESRI 2013; Water Features, ESRI 2008, USGS 2010;
State and County Boundaries, ESRI 2013

NOTES:
- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.
- Substation symbols do not necessarily represent precise locations.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

0 10 20 40 60
Miles

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Little Snake Crossing

F.2 Little Snake River Crossing

This variation area is located approximately 15 miles northwest of Maybell, Colorado, at the crossing of the Little Snake River east of Sevenmile Ridge (Map F-2). Route variations at the crossing of the Little Snake River were included in the Draft EIS as part of three alternative routes (Alternatives WYCO-B, WYCO-C, and WYCO-F). The route variation at the Little Snake River crossing (Link C72) was included to provide an option to take advantage of less rugged terrain and to provide greater separation from a private land use along the southern portion of Link C71.

Most of the lands crossed by the route of Alternative WYCO-B (the Agency Preferred Alternative) route (C71) and the Variation 1 (C72) are administered by the Bureau of Land Management (BLM) except for the privately owned lands adjacent to the river and at the southern end of Link C71. Primary resource issues in this area include greater sage-grouse habitat, Ute ladies'-tresses modeled habitat, potential yellow-billed cuckoo habitat, views from a residence near the Little Snake River, and Lower Little Snake and Deep Creek Lands with Wilderness Characteristics.

Table F-1 presents a comparison of substantive resource issues for each route variation. Table F-2 is a comparison of miles of each jurisdiction crossed by the route variations, and Table F-3 is a summary of estimated ground disturbance and vegetation clearing for the route variations. Tables F-4 to F-11 describe the inventory, impacts, and plan compliance for each resource in a comparison of route variations.

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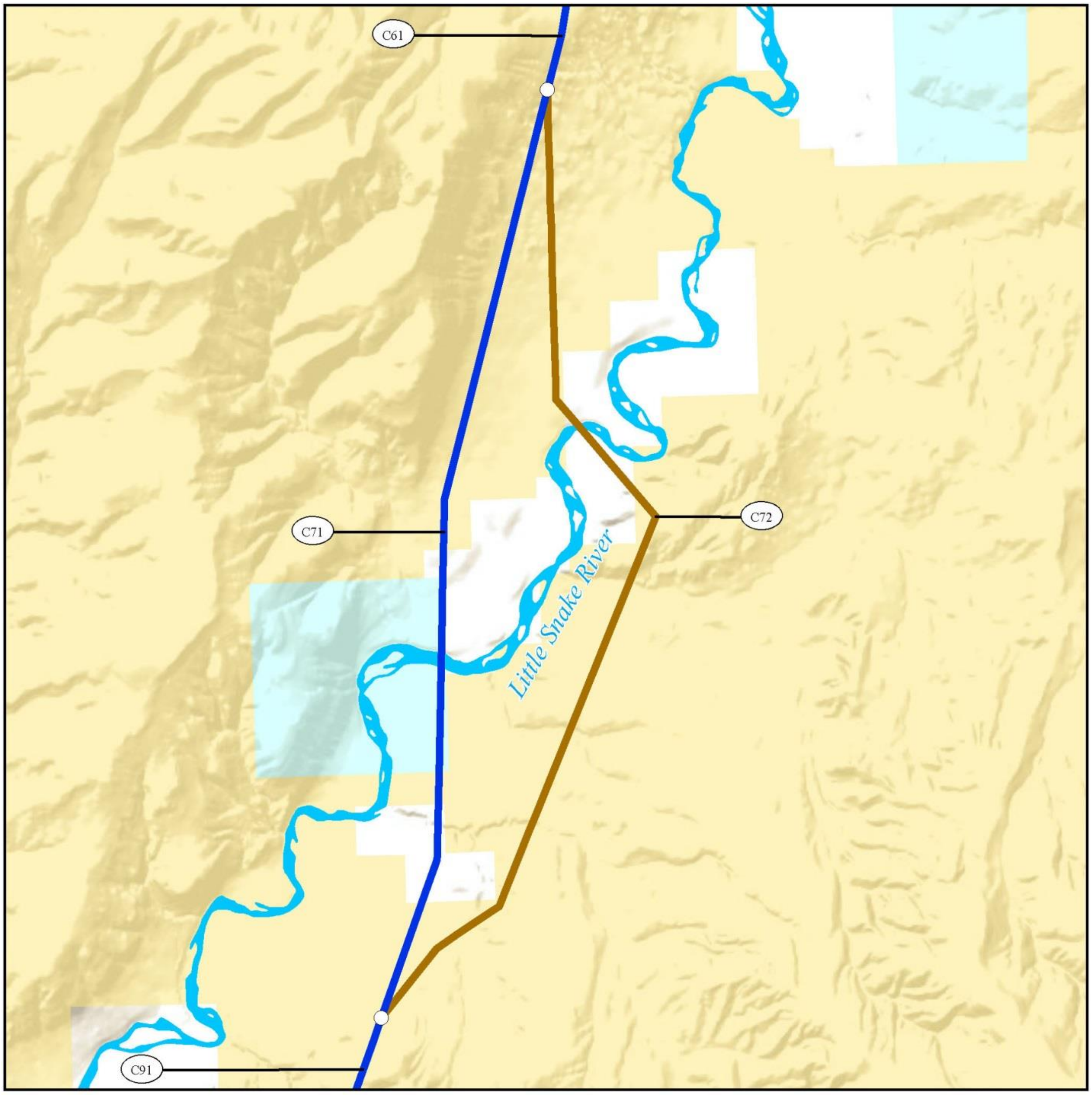

Map F-2

Little Snake River Crossing

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Project Features

▬	Alternative WYCO-B
▬	Variation 1
⬭-	Link Number
○	Link Node

Land Ownership

■	Bureau of Land Management
■	State Land
□	Private Land

General Reference

■	Little Snake River

SOURCES:
Land Jurisdiction, BLM 2013;
National Hydrography Dataset, USGS 2010

NOTES:
- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

0 0.5 1
Miles

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TABLE F-1 LITTLE SNAKE – COMPARISON OF ROUTE VARIATIONS BY RESOURCE		
Resource	**Alternative WYCO-B Link C71(4.9 miles)**	**Variation 1 Link C72 (5.4 miles)**
Climate and Air Quality	Due to the regional-scale of climate and air quality data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.1 for this alternative route.	Same as WYCO-B
Earth Resources (miles crossed) (for detailed information, refer to Table F-4)	▪ 0.1 mile of moderate landslide hazard ▪ 0.6 mile of oil and gas leases ▪ 2.2 miles of prime farmland	▪ 1.4 miles of moderate landslide hazard ▪ 2.7 miles of oil and gas leases ▪ 1.2 miles of prime farmland ▪ 0.2 miles of moderate susceptibility to wind and water erosion
Paleontological Resources (for detailed information, refer to Table F-5)	Crosses 3.1 miles of Potential Fossil Yield Classification (PFYC) 3	Crosses 4.0 miles of PFYC 3
Water Resources (for detailed information, refer to Table F-6)	Impacts on Little Snake River and associated habitats	Same as WYCO-B
Biological Resources		
Vegetation (for detailed information, refer to Table F-7)	No critical issues	No critical issues
Special Status Plants (for detailed information, refer to Table F-7)	Potential impacts on Ute Ladies'-tresses potential habitat at Little Snake River crossing	Same as WYCO-B
Wildlife (for detailed information, refer to Table F-7)	No critical issues	No critical issues
Special Status Wildlife (for detailed information, refer to Table F-7)	Crosses 0.3 mile of high impact on greater sage-grouse habitats within 4 miles of leks	Crosses 0.5 mile of high impacts on greater sage-grouse habitats within 4 miles of leks and sage-grouse priority habitat
Migratory Birds (for detailed information, refer to Table F-7)	Due to the regional-scale of migratory bird data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.9 for this alternative route.	Same as WYCO-B
Fish and Aquatics (for detailed information, refer to Table F-7)	None	None

TABLE F-1
LITTLE SNAKE – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative WYCO-B Link C71(4.9 miles)	Variation 1 Link C72 (5.4 miles)
Land Use		
Land Use (for detailed information, refer to Table F-8)	Crosses 0.1 mile of pivot agriculture resulting in a moderate impact.	None
Parks, Preservation, and Recreation (for detailed information, refer to Table F-9)	None	None
Transportation and Access (for detailed information, refer to Table F-9)	None	None
Congressional Designations (for detailed information, refer to Table F-9)	None	None
Special Designations and Other Management Areas (for detailed information, refer to Table F-9)	None	None
Lands with Wilderness Characteristics (for detailed information, refer to Table F-9)	Crosses 1.0 mile of Deep Canyon and Lower Little Snake inventoried lands with wilderness characteristics in the Little Snake Field Office.	Crosses 3.2 miles of Deep Canyon and Lower Little Snake inventoried lands with wilderness characteristics in the Little Snake Field Office
Inventoried Roadless Areas and Unroaded/Undeveloped Areas (for detailed information, refer to Table F-9)	None	None
Visual Resources (for detailed information refer to Table F-10	▪ High impact on views from residences adjacent to the Little Snake River ▪ Moderate impact on views from the Little Snake River and an adjacent destination route	Similar to WYCO-B except moderate impact on views from residence adjacent to the Little Snake River
Cultural Resources (for detailed information, refer to Table F-11)	▪ 11 sites identified by the Class I inventory; no known sites in the Project area of potential effect (APE) ▪ Crosses 0.0 mile of high cultural resource intensity ▪ No key cultural resources have been identified	▪ 13 sites identified by the Class I inventory; one known site in the Project APE ▪ Crosses 0.2 mile of high cultural resource intensity ▪ No key cultural resources have been identified
Fire Ecology and Management	Due to the regional-scale of fire ecology and management data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.21 for this alternative route.	Same as WYCO-B

TABLE F-1
LITTLE SNAKE – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative WYCO-B Link C71(4.9 miles)	Variation 1 Link C72 (5.4 miles)
Social and Economic Conditions	Effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.22 for this alternative route.	Same as WYCO-B
Public Health (electric and magnetic fields [EMF])	Due to the scale of public health data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.23 for this alternative route.	Same as WYCO-B

TABLE F-2
LITTLE SNAKE RIVER CROSSING – 500-KILOVOLT (kV) TRANSMISSION LINE PARALLEL CONDITIONS AND JURISDICTION BY ROUTE VARIATION

Focus of Comparison	Alternative WYCO-B Link C71 (4.9 miles)	Variation 1 Link C72 (5.4 miles)
Jurisdiction (miles crossed)		
BLM	3.3	4.8
U.S. Forest Service (USFS)	0.0	0.0
National Park Service (NPS)	0.0	0.0
State	0.9	0.0
Tribal	0.0	0.0
Private	0.7	0.6

TABLE F-3
LITTLE SNAKE RIVER CROSSING – SUMMARY OF ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING FOR THE 500-KILOVOLT TRANSMISSION LINE AND SERIES COMPENSATION STATIONS

Focus of Comparison	Alternative WYCO-B Link C71 (4.9 miles)	Variation 1 Link C72 (5.4 miles)
Temporary disturbance (acres)[1, 4]	54	60
Permanent disturbance (acres)[2, 4]	17	22
Total disturbance (acres)	72	82
Transmission-line right-of-way vegetation clearing (acres)[3, 4]	10	3
Access Roads		
Existing (miles)[5]	2.1	1.1
New (miles)[6]	2.8	4.3

SOURCE: Assumptions for the calculations are derived from the Applicant’s description of the Project (Appendix B).

NOTES:

[1] Temporary disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure), wire tensioning/pulling sites (250 by 400 feet; two every 3 to 5 miles), wire splicing sites (100 by 100 feet every 9,000 feet), multi-purpose construction yards (30-acre site located approximately every 20 miles), helicopter fly yards (15-acre site; located approximately every 5 miles), guard structures (150 by 75 feet; approximately 1.4 structures per 1 mile), and temporary access roads (refer to Table 2-1).

[2] Permanent disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (60 by 60 feet per structure), communication regeneration stations (100 by 100 feet, one station approximately every 55 miles), series compensation stations, and permanent access roads (refer to Tables 2-1 and 2-2).

[3] Right-of-way vegetation clearing: vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, mountain forest, mountain shrub, pinyon-juniper, and riparian), and overlap with other disturbance in the Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes and route variations at this time and is required to accurately identify locations of temporary and permanent access roads. Temporary and permanent disturbance calculations include estimated disturbance for all access roads.

[4] Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, columns may not sum exactly.

[5] Miles of the reference centerline that are anticipated to use existing and/or improved existing access roads.

[6] Miles of the reference centerline that are anticipated to use newly constructed and/or overland access.

TABLE F-4
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES

Focus of Comparison	**Alternative WYCO-B Links C71 (4.9 miles)**	**Variation 1 Links C72 (5.4 miles)**
Geologic Hazards		
Affected environment (miles crossed)	▪ 0.0 mile of mine subsidence ▪ 4.9 miles of low flood hazard ▪ 0.1 mile of moderate and 4.8 miles of low landslide hazard	▪ 0.0 mile of mine subsidence ▪ 5.4 miles of low flood hazard ▪ 5.4 miles of low landslide hazard
Environmental consequences	Low impacts from geologic hazards	Same as WYCO-B
Selective mitigation	3	None
Cumulative effects	The crossing would be in proximity to the TransWest Express transmission line	Same as WYCO-B
Soil Resources		
Affected environment (miles crossed)	▪ 0.1 miles of no and 4.8 miles of low water erosion ▪ 4.9 miles of low wind erosion ▪ 2.2 miles of prime farmland	▪ 5.2 miles of low and 0.2 miles of moderate water erosion ▪ 5.2 miles of low and 0.2 miles of moderate wind erosion ▪ 1.2 miles of prime farmland
Environmental consequences	Would affect more prime farmland	Would have more potential for wind and water erosion on soils
Selective mitigation	1, 3, 7, and 13	1, 3, 7, and 13
Cumulative effects	The crossing would in proximity to the TransWest Express transmission line. The Project would have minor incremental impact on farmlands.	Same as WYCO-B
Mineral Resources		
Affected environment (miles crossed)	▪ 0 active mines ▪ 0.6 mile of oil and gas leases	▪ 0 active mines ▪ 2.7 miles of oil and gas leases
Environmental consequences	Would affect less area of oil and gas leases	Would affect more oil and gas leases
Selective mitigation	None	None
Cumulative effects	The crossing would be in proximity to the TransWest Express transmission line. Project could have minor incremental impact on oil and gas leases	Same as WYCO-B
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-5
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	**Alternative WYCO-B Links C71 (4.9 miles)**	**Variation 1 Links C72 (5.4 miles)**
Affected Environment		
PFYC (miles crossed)	3.1 miles of PFYC 3	4.0 miles of PFYC 3
Known locality density within 1.0 mile of the	4.9 miles	5.4 miles

TABLE F-5
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
centerline (miles crossed)		
Environmental Consequences		
PFYC formations (miles crossed)	Would affect fewer geological formations with PFYC 3	Would affect more geological formations with PFYC 3
Percent of route crossing PFYC 3	63	74
Anticipated impacts on paleontological resources	Moderate impacts on paleontological resources	Same as WYCO-B
Selective mitigation	None	None
Cumulative effects	The crossing would be in proximity to the TransWest Express transmission line. The Project could have minor incremental impact paleontological resources.	Same as WYCO-B
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-6
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Affected Environment		
Class 1: Outstanding waters	None	None
Class 4: State-listed impaired waters	None	None
Palustrine emergent wetlands	None	None
Palustrine forested overstory wetlands	None	None
Palustrine scrub/shrub wetlands	None	None
Perennial stream/river	1 crossing of the Little Snake River	1 crossing of the Little Snake River
Intermittent stream	2 crossings	4 crossings
Riparian areas	2 crossings of small riparian areas associated with the Little Snake River	None identified based on data available for the EIS analysis, but likely to be similar to WYCO-B
Swamp/marsh/estuary	None	None
Well/spring	None	None
Environmental Consequences		
Residual impacts	▪ 0.2 mile of moderate residual impacts ▪ 0.7 mile of low residual impacts	Similar to WYCO-B
Selective mitigation	None	None

TABLE F-6
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Cumulative effects	▪ Vicinity of the proposed TransWest Express transmission line and existing agricultural and residential developments ▪ Minor incremental impact on water resources in the area	Similar to WYCO-B
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-7
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Vegetation		
Affected environment (miles of vegetation communities crossed)	▪ 2.2 miles of big sagebrush ▪ 0.1 mile of riparian ▪ 2.5 miles of shrub/shrub steppe ▪ 0.1 mile of water	▪ 0.1 mile of barren ▪ 3.7 miles of big sagebrush ▪ 1.5 miles of shrub/shrub steppe ▪ 0.1 mile of water
Environmental consequences (miles crossed)	▪ 0.1 mile of moderate-to-high impacts ▪ 2.3 miles of moderate impacts ▪ 2.5 miles of low-to-moderate impacts	▪ 3.9 miles of moderate impacts ▪ 1.5 miles of low-to-moderate impacts
Selective mitigation	1, 2, 4, and 7	1, 2, 4, and 7
Cumulative effects	▪ Vicinity of the proposed TransWest Express transmission line and existing agricultural and residential developments ▪ Minor incremental impact on water resources in the area	▪ Similar to WYCO-B
Special Status Plants		
Affected environment (miles crossed)	0.1 mile of Ute ladies'-tresses potential habitat	No identifiable special status plant habitat crossed; however, Ute ladies'-tresses potential habitat likely to be present in the area
Environmental consequences (miles crossed)	0.1 mile of low impacts	None
Selective mitigation	2 and 7	None
Cumulative effects	▪ Vicinity of the proposed TransWest Express transmission line and existing agricultural and residential developments ▪ Minor incremental impact on Ute ladies'-tresses potential habitat in the area	None

TABLE F-7
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Wildlife		
Affected environment (miles crossed)	▪ 4.3 miles of elk crucial winter range ▪ 3.1 miles of mule deer crucial winter range ▪ 3.8 miles of pronghorn severe winter range	▪ 5.0 miles of elk crucial winter range ▪ 1.9 miles of mule deer crucial winter range ▪ 5.1 miles of pronghorn severe winter range
Environmental consequences (miles crossed)	4.9 miles of low impacts	5.4 miles of low impacts
Selective mitigation	12 and 15	12 and 15
Cumulative effects	▪ Vicinity of the proposed TransWest Express transmission line and existing agricultural and residential developments ▪ Minor incremental impact on big game in the area	Similar to WYCO-B
Special Status Wildlife		
Affected environment (miles crossed)	▪ 1.3 miles of mountain plover potential habitat ▪ 2.2 miles of pygmy rabbit potential habitat ▪ 3.3 miles of white-tailed prairie dog potential colonies ▪ 0.3 mile of greater sage-grouse habitat within 4 miles of leks in priority habitat ▪ 4.9 miles of greater sage-grouse general habitat ▪ No yellow billed cuckoo potential habitat identified based on data used in EIS analysis, but likely similar to Variation 1	▪ 1.3 miles of mountain plover potential habitat ▪ 3.3 miles of pygmy rabbit potential habitat ▪ 1.3 miles of white-tailed prairie dog potential colonies ▪ 0.1 mile of yellow-billed cuckoo potential habitat ▪ 0.5 mile of greater sage-grouse habitat within 4 miles of leks in priority habitat ▪ 5.3 miles of greater sage-grouse general habitat ▪ 0.1 mile of greater sage-grouse priority habitat
Environmental consequences (miles crossed)	▪ 0.3 mile of high impacts ▪ 4.0 miles of moderate impacts ▪ 0.6 mile of low impacts	▪ 0.5 mile of high impacts ▪ 4.3 miles of moderate impacts ▪ 0.6 mile of low impacts
Selective mitigation	2, 5, 7, 12, and 13	2, 4, 5, 7, 12, and 13
Cumulative effects	▪ Vicinity of the proposed TransWest Express transmission line and existing agricultural and residential developments ▪ Minor incremental impacts on special status wildlife in the areas where these species are present.	Similar to WYCO-B

TABLE F-7
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Fish and Aquatics		
Affected environment	▪ Crosses the Little Snake River, which provides habitat for fish and other aquatic resources ▪ No specific resources analyzed in detail in the EIS identified in this area	Similar to WYCO-B
Environmental consequences	Using the comparison method of the EIS, no residual impacts were identified	Similar to WYCO-B.
Selective mitigation	None	None
Cumulative effects	▪ Vicinity of the proposed TransWest Express transmission line and existing agricultural and residential developments ▪ Minor incremental impact on fish and aquatic habitats in the Little Snake River	Similar to WYCO-B
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-8
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Utility Corridors (miles)		
Designated (BLM and USFS)	0.0	0.0
West-wide Energy Corridor	0.0	0.0
Parallel Linear Facilities (miles)		
500kV	0.0	0.0
345kV	0.0	0.0
138kV	0.0	0.0
230kV	0.0	0.0
Pipeline	0.0	0.0
Existing Land Use		
Affected environment and consequences	Crosses 0.1 mile of center-pivot agriculture resulting in a moderate residual impact	No key impacts
Selective mitigation	11	None
Cumulative effects	▪ Short-term: the potential for limited access to fields or agriculture operations during construction ▪ Long-term: utility and industrial infrastructure potentially reducing the amount of and/or altering agriculture production lands.	None

TABLE F-8
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Authorized Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Future Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Zoning and General Plan Management Direction[1]		
Generalized permitting	No key permitting requirements	No key permitting requirements
Selective mitigation	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

NOTE: [1]Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city or county. The generalized permitting is for disclosure and comparison only.

TABLE F-9
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4)
Parks, Preservation, and Recreation		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Transportation and Access		
Affected environment	Crosses Moffat County Roads 26 and 21 and other roadways	Crosses Moffat County Roads 26 and 21
Environmental consequences	Anticipate moderate impacts where temporary closures and/or delays would occur from construction of the Project when crossing roadways (e.g. Moffat County Road 21). See Section 3.2.13 for more information.	Same as WYCO-B
Selective mitigation	5 and 9	5 and 9
Cumulative effects	Not applicable	Not applicable
Congressional Designations		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None

TABLE F-9 LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS		
Focus of Comparison	**Alternative WYCO-B Links C71 (4.9 miles)**	**Variation 1 Links C72 (5.4)**
Special Designations and Other Management Areas		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Lands with Wilderness Characteristics		
Affected environment and consequences	Crosses 1.0 mile of Deep Canyon and Lower Little Snake inventoried lands with wilderness characteristics in the Little Snake Field Office	Crosses 3.2 miles of Deep Canyon and Lower Little Snake inventoried lands with wilderness characteristics in the Little Snake Field Office
Selective mitigation	None	None
Cumulative effects	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas		
Affected environment and consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-10 LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES		
Focus of Comparison	**Alternative WYCO-B Links C71 (4.9 miles)**	**Variation 1 Links C72 (5.4 miles)**
Affected Environment		
Scenery (miles crossed)	▪ 4.9 miles of Class B	▪ 5.0 miles of Class B ▪ 0.4 mile of Class C
High concern viewers (miles crossed)	▪ 1.0 mile of views within 0.5 mile ▪ 0.9 mile of views between 0.5 mile and 1.0 mile	▪ 0.0 mile of views within 0.5 mile ▪ 1.7 miles of views between 0.5 mile and 1.0 mile
Moderate concern viewers (miles crossed)	▪ 2.7 miles of views within 0.5 mile ▪ 2.2 miles of views between 0.5 mile and 1.0 mile	▪ 3.5 miles of views within 0.5 mile ▪ 1.9 miles of views between 0.5 miles and 1.0 mile
Federal Agency Visual Management Objectives (miles crossed)	▪ 3.2 miles of BLM VRM Class III	▪ 4.9 miles of BLM VRM Class III

TABLE F-10
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Environmental Consequences		
Scenery	No key impacts	No key impacts
Residences	High impact on views from residence adjacent to the Little Snake River	Moderate impact on views from residence adjacent to the Little Snake River
Travel routes	Moderate impact on views from Little Snake River destination route	Similar to WYCO-B
Recreation areas	Moderate impact on views from Little Snake River	Similar to WYCO-B
Special designations	No key impacts	No key impacts
Selective mitigation	2	2, 3, and 5
Cumulative effects	Introduction of the Project in context with the TransWest Express transmission line would increase impacts on scenery and views described above.	Similar to WYCO-B
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-11
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Affected environment	▪ 11 sites identified by the Class I inventory ▪ No known sites in the Project APE ▪ No key cultural resources, National Historic Trails (NHTs) or potential NHTs, National Historic Landmarks (NHLs), traditional cultural properties (TCPs), or areas of critical environmental concern (ACECs) with cultural components were identified	▪ 13 sites identified by the Class I inventory ▪ One known site in the Project APE ▪ No key cultural resources, NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified
Environmental consequences (miles crossed)	▪ 0.0 mile of high cultural resource intensity ▪ 0.2 mile of moderate cultural resource intensity ▪ 4.7 miles of low cultural resource intensity	▪ 0.2 mile of high cultural resource intensity ▪ 0.0 mile of moderate cultural resource intensity ▪ 5.2 miles of low cultural resource intensity
Selective mitigation	Specific mitigation measures for historic properties would be developed by the BLM in consultation with the consulting parties to the Programmatic Agreement, American Indian tribes, and the Project Applicant, and implemented to mitigate any identified adverse impacts. These may include, but are not limited to, Project modifications and data recovery studies.	Same as WYCO-B

TABLE F-11
LITTLE SNAKE RIVER CROSSING – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C71 (4.9 miles)	Variation 1 Links C72 (5.4 miles)
Cumulative effects	The addition of the Project to past and present actions and Reasonably Foreseeable Future Actions (RFFAs) would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources.	Same as WYCO-B
Plan Compliance		
Plan amendment (Yes or No)	No	No

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Deerlodge Road Area

F.3 Deerlodge Road Area

This variation area is located 15 miles southwest of Maybell, Colorado, roughly parallel to the U.S. Highway 40 (Map F-3). The Draft EIS presented two route options (Map F-3). One route option, the route of Alternative WYCO-B (the Agency Preferred Alternative; Links C171, C173, C174) parallels existing 138kV and 345kV transmission lines. However, this option crosses the Tuttle Ranch Conservation Easement (designated as such in October 2013) and Cross Mountain Ranch Conservation Easement (designated as such in December 2014), the Agreements for which excludes new overhead transmission lines crossing the conservation easements. The other route option, Variation 1 (Links C94, C93) was developed to skirt the western boundary of the Tuttle Ranch Conservation Easement and roughly parallels U.S. Highway 40, rejoining the route of Alternative WYCO-B southwest of the easement. This route variation crosses the Deerlodge Road entrance to Dinosaur National Monument at the intersection with U.S. Highway 40. Most of Deerlodge Road is owned in fee by the NPS, except for a parcel of land administered by the State of Colorado north of the intersection of Deerlodge Road and U.S. Highway 40. Because of NPS’ mandate to identify and analyze viable alternatives in cases where NPS-administered land may be impaired, the NPS requested consideration of an additional route variation that crosses the Deerlodge Road on the State of Colorado parcel. In response, Variation 2 (Links C94, C95) was developed and analyzed between the Draft EIS and Final EIS.

The three route variations analyzed in the Final EIS start on the north side of U.S. Highway 40 and end 6.5 to 7.7 miles to the southwest on the south side of U.S. Highway 40. Refer to Map F-3. The route of Alternative WYCO-B, the Agency Preferred Alternative, immediately crosses U.S. Highway 40, runs south for 0.8 miles, and then follows an existing transmission line corridor through the Tuttle Ranch Conservation Easement for 3.0 miles and Cross Mountain Ranch Conservation Easement for 1.1 miles. Variation 1 parallels the north side of U.S. Highway 40 for 3.8 miles, crosses Deerlodge Road in an area under NPS jurisdiction, continues north of U.S. Highway 40 for 1.9 miles, crosses U.S. Highway 40, and terminates at an existing transmission line corridor after an additional 0.8 miles. Variation 2 parallels the north side of U.S. Highway 40 for 2 miles, turns west for 2 miles, crosses Deerlodge Road on lands administered by the State of Colorado, then turns south, crosses U.S. Highway 40, and ends at an existing transmission line corridor after 3.7 miles.

In the event Variation 1 crossing Deerlodge Road on NPS-administered land were selected as the route for construction of the transmission line, the NPS would have to process an application for right-of-way, which would have to include environmental analysis. Therefore, the NPS asked for a more detailed analysis and comparison of the three variations in this area. The analysis and comparison is presented in Appendix G.

The lands crossed by the route of Alternative WYCO-B (the Agency Preferred Alternative) and route variations are mostly privately owned except for parcels of BLM, state, and NPS-administered lands adjacent to Deerlodge Road. Primary resource issues in this area include visual resource and recreation impacts on Dinosaur National Monument, crossing the Tuttle Ranch Conservation Easement and Cross Mountain Lower Ranch Conservation Easement, and lands with wilderness characteristics.

Table F-12 is a comparison of substantive resource issues for each route variation. Table F-13 is a comparison of miles of each jurisdiction crossed by the route variations, and Table F-14 is a summary of estimated ground disturbance and vegetation clearing for the route variations. Tables F-15 to F-22 describe the inventory, impacts, and plan compliance for each resource in a side-by-side comparison of route variations.

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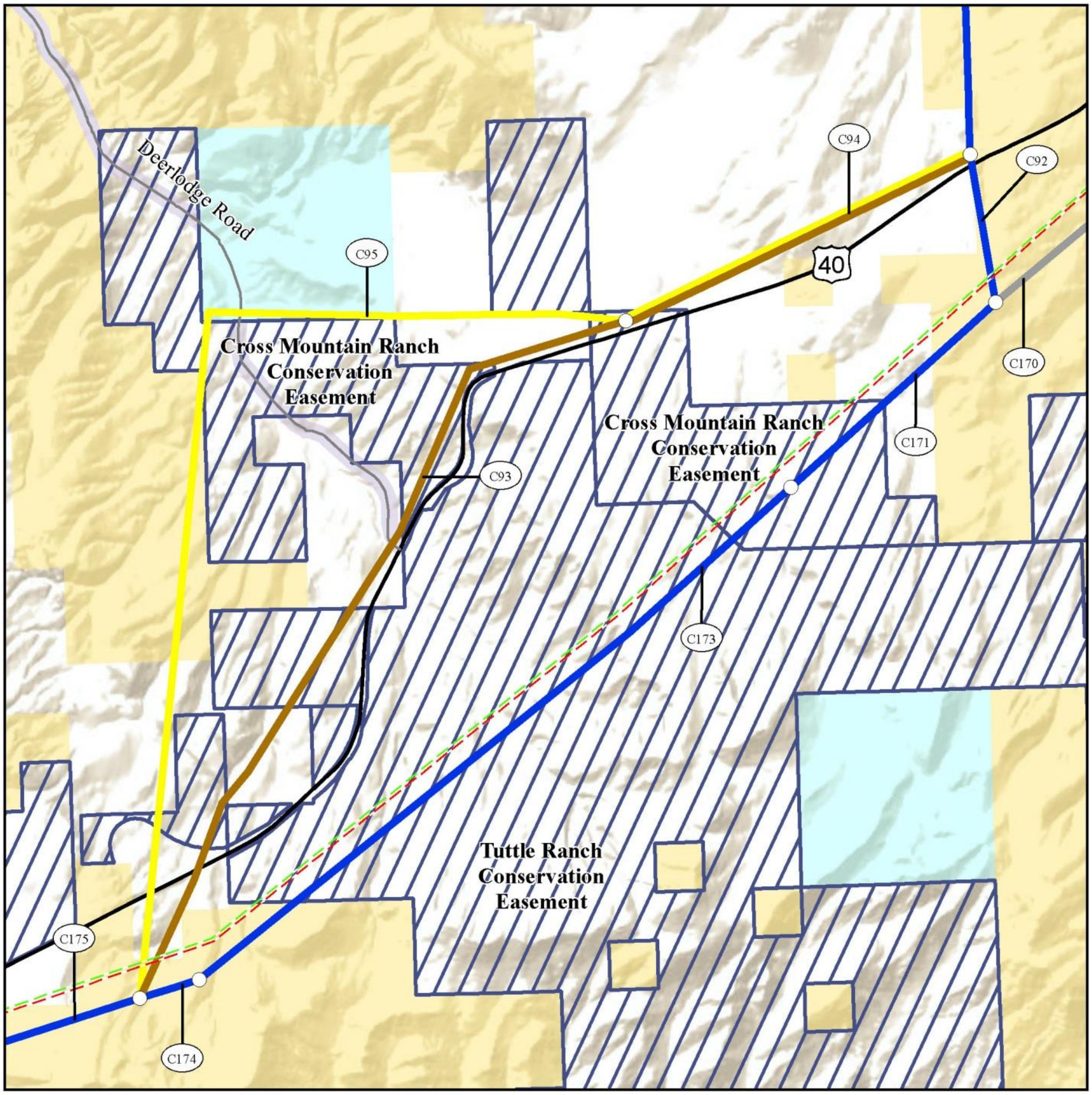
Deerlodge Road
C94
C92
C95
40
Cross Mountain Ranch Conservation Easement
C93
Cross Mountain Ranch Conservation Easement
C170
C171
C173
Tuttle Ranch Conservation Easement
C175
C174

Map F-3

Deerlodge Road Area

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Project Features

- 🟦 Alternative WYCO-B
- 🟫 Variation 1
- 🟨 Variation 2
- ▬ All Other Alternative Routes
- ⊙- Link Number
- ○ Link Node

Land Ownership

- 🟨 Bureau of Land Management
- 🟪 National Park Service
- 🟦 State Land
- ☐ Private Land

General Reference

- -- 345kV Transmission Line
- -- 138kV Transmission Line
- ▬ U.S. Highway
- ▬ Other Road
- ▨ Conservation Easement

SOURCES:
Land Jurisdiction, BLM 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009; Highways and Roads ESRI 2013;
Conservation Easements, BLM 2015, CPW 2013

NOTES:
- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.
- Alternative routes are graphically depicted on map and, in most cases, share centerline alignment in common areas.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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TABLE F-12 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS BY RESOURCE			
Resource	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
Climate and Air Quality	Due to the regional-scale of climate and air quality data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.1 for this alternative route.	Same as WYCO-B	Same as WYCO-B
Earth Resources (miles crossed) (for detailed information, refer to Table F-15)	▪ 5.5 miles of low flood hazard ▪ 1.0 mile of moderate landslide hazard ▪ 5.5 miles of low landslide hazard ▪ 2.4 miles of oil and gas leases ▪ 0.2 mile of prime farmland ▪ 0.6 mile of soils with moderate susceptibility to wind and water erosion	▪ 6.5 miles of low flood hazard ▪ 0.4 mile of moderate landslide hazard ▪ 6.1 miles of low landslide hazard ▪ 2.0 miles of oil and gas leases ▪ 0.0 mile of prime farmland	▪ 7.7 miles of low flood hazard ▪ 0.4 mile of moderate landslide hazard ▪ 7.3 miles of low landslide hazard ▪ 2.8 miles of oil and gas leases ▪ 0.6 mile of prime farmland ▪ 0.5 mile of soils with moderate susceptibility to wind and water erosion
Paleontological Resources (miles crossed) (for detailed information, refer to Table F-16)	▪ 0.4 mile of PFYC 3 ▪ 6.1 miles of PFYC 5	▪ 6.5 miles of PFYC 5	▪ 0.7 mile of PFYC 3 ▪ 7.0 miles of PFYC 5
Water Resources (for detailed information, refer to Table F-17)	No critical issues. However, the impacts on water resources would be reduced by colocation with existing linear infrastructure.	No critical issue.	No critical issues
Biological Resources			
Vegetation (for detailed information, refer to Table F-18)	No critical issues. However the impacts on vegetation resources would be reduced by colocation with existing linear infrastructure.	No critical issues	No critical issues
Special Status Plants (for detailed information, refer to Table F-18)	None	None	None

TABLE F-12
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Wildlife (for detailed information, refer to Table F-18)	Alternative WYCO-B would affect important big game habitats recognized by Colorado Parks and Wildlife (CPW) on the Tuttle Ranch Conservation Easement. Colocation with existing transmission lines would reduce these effects. However, the Project would extend anthropogenic disturbances further into these important habitats.	Variation 1 would avoid important big game habitats recognized by CPW on the Tuttle Ranch Conservation Easement. Variation 1 would be located near U.S. Highway 40, where big game habitats and behavior have likely already been affected by the highway.	Variation 2 would avoid important big game habitats recognized by CPW on the Tuttle Ranch Conservation Easement. However, Variation 2 would be located in an area with few existing anthropogenic disturbances.
Special Status Wildlife (for detailed information, refer to Table F-18)	Alternative WYCO-B would affect high-quality sage-grouse nesting and brood-rearing habitat as well as white-tailed prairie dog colonies that are a potential preferred location for the future release of black-footed ferrets. Although the density of sage-grouse on the Tuttle Ranch Conservation Easement property is relatively low compared to other portions of the Northwest Colorado population, the area provides connectivity between key areas of priority habitat from the Axial Basin to the Blue Mountain area (east to west). Colocation with existing transmission lines would help reduce these effects.	Variation 1 would avoid important sage-grouse and white-tailed prairie dog habitats recognized by CPW on the Tuttle Ranch Conservation Easement. However, sage-grouse priority habitats would still be impacted by this variation. Variation 1 would be located near U.S. Highway 40, where special status wildlife habitats and behavior have likely already been affected by the highway.	Variation 2 would avoid important sage-grouse and white-tailed prairie dog habitats recognized by CPW on the Tuttle Ranch Conservation Easement. However, sage-grouse priority habitats would still be affected by this variation. Variation 2 would be located in an area with few existing anthropogenic disturbances.
Migratory Birds (for detailed information, refer to Table F-18)	Due to the regional-scale of migratory bird data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.9 for this alternative route.	Same as WYCO-B	Same as WYCO-B
Fish and Aquatics (for detailed information, refer to Table F-18)	None	None	None
Land Use			
Land Use (for detailed information, refer to Table F-19)	None	None	0.2 mile of moderate impact from crossing residential properties

TABLE F-12
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Parks, Preservation, and Recreation (for detailed information, refer to Table F-20)	None	None	None
Transportation and Access (for detailed information, refer to Table F-20)	None	None	None
Congressional Designations (for detailed information, refer to Table F-20)	None	Crosses 0.2 mile of Dinosaur National Monument (Deerlodge Road). Crossing the monument would require a right-of-way granted to the Applicant by the NPS prior to construction. The crossing is inconsistent with the approved General Management Plan (GMP), EIS, and Record of Decision for the monument. A right-of-way would only be granted by NPS if there is no practicable alternative to such use of NPS lands per the NPS Director's Order 53.	None
Special Designations and Other Management Areas (for detailed information, refer to Table F-20)	Crosses 4.1 miles of the Tuttle Ranch and Cross Mountain Ranch conservation easements. The granting of easements or rights-of-way for transmission is prohibited. The only effective mitigation would be avoidance in lieu of amending the terms of the agreement.	Crosses 2.5 miles of the Tuttle Ranch and Cross Mountain Ranch conservation easements. The granting of easements or rights-of-way for transmission is prohibited. The only effective mitigation would be avoidance in lieu of amending the terms of the agreement.	Crosses 1.8 miles of the Cross Mountain Ranch Conservation Easement. The granting of easements or rights-of-way for transmission is prohibited. The only effective mitigation would be avoidance in lieu of amending the terms of the agreement.

TABLE F-12
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
Lands with Wilderness Characteristics (for detailed information, refer to Table F-20)	None	None	Crosses 1.6 miles of the Twelvemile Mesa inventoried lands with wilderness characteristics in the BLM Little Snake Field Office. This alternative would cross the eastern portion of the unit, with remaining portion of the unit meeting the 5,000+ acre size requirement.
Inventoried Roadless Areas and Unroaded/Undeveloped Areas (for detailed information, refer to Table F-20)	None	None	None
Visual Resources (for detailed information, refer to Table F-21	▪ Low impact on scenery and views due to colocation with existing transmission lines	▪ High impact on views from residences and Dinosaur National Monument (Deerlodge Road) including the kiosk ▪ Moderate impact on views from U.S. Highway 40	▪ Similar to Variation 1 except for moderate impacts on Class B scenery and impacts on Dinosaur National Monument are primarily associated with Deerlodge Road
Cultural Resources (for detailed information, refer to Table F-22)	▪ 14 sites identified by the Class I inventory; one known site in the Project APE ▪ 0.2 miles of high cultural resource intensity ▪ Unrecorded segment of the old Victory Highway is crossed by Link C92 ▪ Key resources are the old Victory Highway and the Deerlodge Road (issue identified for analysis); the Deerlodge Road is outside of the Project APE	▪ 17 sites identified by the Class I inventory; no known sites in the Project APE ▪ 0.0 miles of high cultural resource intensity ▪ Unrecorded segment of the old Victory Highway is crossed by Link C93 ▪ Same key resources as WYCO-B; the Deerlodge Road in in the Project APE	▪ 19 sites identified by the Class I inventory; no known sites in the Project APE ▪ 0.0 mile of high cultural resource intensity ▪ Unrecorded segment of the old Victory Highway is crossed by Link C95 ▪ Same key resources as WYCO-B; the Deerlodge Road is in the Project APE

TABLE F-12 **DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS BY RESOURCE**			
Resource	**Alternative WYCO-B** **Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1** **Links C94, C93 (6.5 miles)**	**Variation 2** **Links C94, C95 (7.7 miles)**
Fire Ecology and Management	Due to the regional-scale of fire ecology and management data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.21 for this alternative route.	Same as WYCO-B	Same as WYCO-B
Social and Economic Conditions	Effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.22 for this alternative route.	Same as WYCO-B	Same as WYCO-B
Public Health (EMF)	Due to the scale of public health data and the associated analysis for the Project, effects associated with this portion of Alternative WYCO-B are consistent with those described in Section 3.2.23 for this alternative route.	Same as WYCO-B	Same as WYCO-B

TABLE F-13
DEERLODGE ROAD AREA – 500-KILOVOLT TRANSMISSION LINE PARALLEL CONDITIONS AND JURISDICTION BY ROUTE VARIATION

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Jurisdiction (miles crossed)			
BLM	2.1	0.2	1.7
USFS	0.0	0.0	0.0
NPS	0.0	0.1	0.0
State	0.0	0.0	1.0
Tribal	0.0	0.0	0.0
Private	4.4	6.2	5.0

TABLE F-14
DEERLODGE ROAD AREA – SUMMARY OF ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING FOR THE 500-KILOVOLT TRANSMISSION LINE AND SERIES COMPENSATION STATIONS

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Temporary disturbance (acres)[1, 4]	72	72	86
Permanent disturbance (acres)[2, 4]	27	21	33
Total disturbance (acres)	99	94	119
Transmission-line right-of-way vegetation clearing (acres)[3, 4]	0	0	0
Access Roads			
Existing (miles)[5]	5.4	6.5	5.4
New (miles)[6]	1.1	0.0	2.3

SOURCE: Assumptions for the calculations are derived from the Applicant's description of the Project (Appendix B).

NOTES:

[1] Temporary disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure), wire tensioning/pulling sites (250 by 400 feet; two every 3 to 5 miles), wire splicing sites (100 by 100 feet every 9,000 feet), multi-purpose construction yards (30-acre site located approximately every 20 miles), helicopter fly yards (15-acre site; located approximately every 5 miles), guard structures (150 by 75 feet; approximately 1.4 structures per 1 mile), and temporary access roads (refer to Table 2-1).

[2] Permanent disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (60 by 60 feet per structure), communication regeneration stations (100 by 100 feet, one station approximately every 55 miles), series compensation stations, and permanent access roads (refer to Tables 2-1 and 2-2).

[3] Right-of-way vegetation clearing: vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, mountain forest, mountain shrub, pinyon-juniper, and riparian), and overlap with other disturbance in the Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes and route variations at this time and is required to accurately identify locations of temporary and permanent access roads. Temporary and permanent disturbance calculations include estimated disturbance for all access roads.

[4] Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, columns may not sum exactly.

[5] Miles of the reference centerline that are anticipated to use existing and/or improved existing access roads.

[6] Miles of the reference centerline that are anticipated to use newly constructed and/or overland access.

TABLE F-15 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES			
Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (Links 6.5)**	**Variation 1 Links C94, C93 (Links 6.5)**	**Variation 2 Links C94, C95 (Links 7.7)**
Geologic Hazards			
Affected environment (miles crossed)	▪ 0.0 mile of mine subsidence ▪ 6.5 miles of low flood hazard ▪ 1.0 mile of moderate and 5.5 miles of low landslide hazard	▪ 0.0 mile of mine subsidence ▪ 6.5 miles of low flood hazard ▪ 0.4 mile of moderate and 6.1 miles of low landslide hazard	▪ 0.0 mile of mine subsidence ▪ 7.7 miles of low flood hazard ▪ 0.4 mile of moderate landslide hazard ▪ 7.3 miles of low landslide hazard
Environmental consequences	Crosses 1.0 mile with moderate susceptibility to landslides	Less susceptibility to landslides	Less susceptibility to landslides
Selective mitigation	3	3	3
Cumulative effects	Project could have incremental impacts on areas prone to landslides	Same as WYCO-B	Same as WYCO-B
Soil Resources			
Affected environment (miles crossed	▪ 0.6 mile of soils with moderate susceptibility to water erosion ▪ 0.6 mile of soils with moderate susceptibility to wind erosion ▪ 0.2 mile of prime farmland	▪ 6.5 miles of low susceptibility to water erosion ▪ 6.5 miles of low susceptibility to wind erosion ▪ 0.0 mile of prime farmland	▪ 0.5 mile of soils with moderate susceptibility to water erosion ▪ 0.5 mile of moderate susceptibility to wind erosion ▪ 0.6 mile of prime farmland
Environmental consequences	Most soils with moderate susceptibility to wind and water erosion	▪ No soils with moderate or high susceptibility to wind and water erosion. ▪ No prime farmlands	More miles of prime farmland than WYCO-B and Variation 1
Selective mitigation	1, 3, 7, and 13	1, 3, 7, and 13	1,3, 7, and 13
Cumulative effects	Could have incremental impacts on soils with susceptibility to erosion and prime farmlands	None	Same as WYCO-B
Mineral Resources			
Affected environment (miles crossed)	▪ 0 active mines ▪ 2.4 miles of oil and gas leases	▪ 0 active mines ▪ 2.0 miles of oil and gas leases	▪ 0 active mines ▪ 2.8 miles of oil and gas leases
Environmental consequences	Second-most miles of leases crossed	Least miles of leases crossed	Most miles of leases crossed
Selective mitigation	None	None	None
Cumulative effects	Could have incremental impacts on oil and gas leases	Same as WYCO-B	Same as WYCO-B

TABLE F-15
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (Links 6.5)	Variation 1 Links C94, C93 (Links 6.5)	Variation 2 Links C94, C95 (Links 7.7)
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

TABLE F-16
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (Links 6.5)	Variation 1 Links C94, C93 (Links 6.5)	Variation 2 Links C94, C95 (Links 7.7)
Affected Environment			
PFYC (miles crossed)	▪ 0.4 mile of PFYC 3 ▪ 6.1 miles of PFYC 5	▪ 6.5 miles of PFYC 5	▪ 0.7 mile of PFYC 3 ▪ 7.0 miles of PFYC 5
Known locality density within 1.0 mile of the centerline	Crosses 6.5 miles of low density for fossil localities	Same as WYCO-B	Crosses 7.7 miles of low density for fossil localities
Environmental Consequences			
PFYC formations	Least miles crossed for those geological units with a PFYC 5, but does cross 0.4 mile of geological units with PFYC 3	Second-most miles crossing geological units with PFYC 5	Crosses the most miles of geological units with PFYC of 5
Percent of route crossing PFYC 5	94	100	91
Impacts on paleontological resources anticipated	Could have high impacts on paleontological resources	Same as WYCO-B	Same WYCO-B
Selective mitigation	None	None	None
Cumulative effects	Could have incremental impacts on paleontological resources	Same	Same
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

TABLE F-17
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5miles)	Variation 2 Links C94, C95 (7.7 miles)
Affected Environment			
Class 1: Outstanding waters	None	None	None
Class 4: State-listed impaired waters	None	None	None

TABLE F-17 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES			
Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
Palustrine emergent wetlands	None	1 crossing	1 crossing
Palustrine forested over story wetlands	None	None	None
Palustrine scrub/shrub wetlands	None	None	None
Perennial stream/river	None	None	None
Intermittent stream	9 crossings of tributaries to the Yampa River	12 crossings of tributaries to the Yampa River	13 crossings of tributaries to the Yampa River
Riparian areas	None	None	None
Swamp/marsh/estuary	None	None	None
Well/spring	None	None	None
Environmental Consequences			
Residual impacts	1.7 miles of low impacts	2.5 miles of low impacts	2.8 miles of low impacts
Selective mitigation	None	None	None
Cumulative effects	▪ Would be colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission line ▪ Minor, incremental contribution to the effects on water resources in the area (colocation with other infrastructure would reduce these effects as it would reduce road construction and resulting potential for sedimentation)	▪ Minor, incremental contribution to the effects on water resources in the area. ▪ Transmission line would not be colocated with other linear transmission line infrastructure and would not benefit from the impact reductions associated with colocation	Same as Variation 1
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

TABLE F-18 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
Vegetation			
Affected environment (miles of vegetation communities crossed)	▪ 4.9 miles of big sagebrush ▪ 0.4 mile of developed ▪ 0.5 mile of grassland ▪ 0.6 mile of pinyon-juniper ▪ 0.1 mile of shrub/shrub steppe	▪ 0.1 mile of agriculture ▪ 4.9 miles of big sagebrush ▪ Developed – 0.5 ▪ Grassland – 0.2 ▪ Pinyon-juniper – 0.8	▪ 0.2 mile of agriculture ▪ 5.5 miles of big sagebrush ▪ Developed – 0.3 ▪ Pinyon-juniper – 1.6 ▪ Shrub/shrub steppe – 0.1
Environmental consequences (miles crossed)	▪ 5.4 miles of moderate impacts ▪ 0.7 mile of low-to-moderate impacts ▪ 0.4 mile of low impacts	▪ 5.1 miles of moderate impacts ▪ 0.8 mile of low-moderate impacts ▪ 0.6 mile of low impacts	▪ 5.5 miles of moderate impacts ▪ 1.7 miles of low-moderate impacts ▪ 0.5 mile of low impacts
Selective mitigation	None	None	None
Cumulative effects	▪ Would be colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission line ▪ Minor, incremental contribution to the effects on water resources in the area (colocation with other infrastructure would reduce these effects as it would reduce road construction and resulting potential for sedimentation)	▪ Minor, incremental contribution to the effects on water resources in the area. ▪ Transmission line would not be colocated with other linear transmission lines and would not benefit from the impact reductions associated with colocation	Same as Variation 1
Special Status Plants			
Affected environment (miles crossed)	Based on the methods used for the interdisciplinary comparison of alternatives in the EIS, no habitats for special status plants is crossed	Same as WYCO-B	Same as WYCO-B
Environmental consequences	None	None	None
Selective mitigation	None	None	None
Cumulative effects	None	None	None

TABLE F-18
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
Wildlife			
Affected environment (miles crossed)	▪ 5.0 miles of elk crucial winter range ▪ 1.3 miles of pronghorn severe winter range Crosses Tuttle Ranch Conservation Easement, recognized by CPW as containing high-quality winter range and migratory routes for the largest elk and mule deer herds in Colorado (including the E-2 Bears Ears and E-6 White River elk herds) and also local pronghorn populations (CPW 2013a); big-game habitat south of U.S. Highway 40 in the Tuttle Ranch Conservation Easement of higher value and importance for big game species than habitat north of U.S. Highway 40 (CPW 2013a).	▪ 3.5 miles of elk crucial winter range ▪ 2.7 miles of mule deer crucial winter range ▪ 1.1 miles of pronghorn severe winter range Located north of U.S. Highway 40 and would avoid the Tuttle Ranch Conservation Easement and associated important big-game habitats recognized by CPW on the easement.	▪ 3.0 miles of elk crucial winter range 0 ▪ 4.3 miles of mule deer crucial winter range ▪ 1.1 miles of pronghorn severe winter range Located north of U.S. Highway 40 and would avoid the Tuttle Ranch Conservation Easement and associated important big-game habitats recognized by CPW on the easement.
Environmental consequences	▪ 5.0 miles of low impacts Would affect important big-game habitats recognized by CPW on the Tuttle Ranch Conservation Easement. Colocation with existing transmission lines would reduce these effects. However, the Project would extend anthropogenic disturbances further into these important habitats.	▪ 5.4 miles of low impacts Avoids important big-game habitats recognized by CPW on the Tuttle Ranch Conservation Easement; Located near U.S. Highway 40 where big game habitats and behavior have likely already been affected by the highway.	▪ 6.9 miles of low impacts Avoids important big-game habitats recognized by CPW on the Tuttle Ranch Conservation Easement; is located in an area with few existing anthropogenic disturbances.
Selective mitigation	12 and 15	12 and 15	12 and 15
Cumulative effects	▪ Colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission line ▪ Would contribute to the existing to the effects on important wildlife resources in the area;	▪ Would contribute to the existing effects on wildlife resources in the area ▪ Transmission line would be colocated with U.S. Highway 40, which has likely already modified wildlife habitats and behavior in the area	▪ Would contribute to the existing effects on wildlife resources in the area ▪ Would be located in an area with little pre-existing disturbance; therefore, the contribution to the

TABLE F-18 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES			
Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
	colocation with other infrastructure would reduce these effects, but the value of habitats affected would be higher than Variation 1 or 2		incremental effects on wildlife would likely be greater than Variation 1.
Special Status Wildlife			
Affected environment (miles crossed)	▪ 0.3 mile of mountain plover potential habitat ▪ 0.7 mile of white-tailed prairie dog potential colonies ▪ 2.8 miles of greater sage-grouse habitat within 4 miles of leks located in priority habitats ▪ 4.8 miles of greater sage-grouse general habitat ▪ 1.7 miles of greater sage-grouse priority habitat ▪ Crosses the Tuttle Ranch Conservation Easement, recognized by CPW as containing extensive areas of high-quality sage-grouse nesting and brood-rearing habitat. Although the density of sage-grouse on the Tuttle Ranch Conservation Easement property is relatively low compared to other portions of the Northwest Colorado population, the area provides connectivity between key areas of priority habitat from the Axial Basin to the Blue Mountain area (east to west). CPW also recognizes the Tuttle Ranch Conservation Easement property as containing some of the highest densities of white-tailed prairie dog colonies anywhere in northwestern	▪ 0.3 mile of mountain plover potential habitat ▪ 3.4 miles of greater sage-grouse habitat within 4 miles of leks located in priority habitats ▪ 3.8 miles of greater sage-grouse general habitat ▪ 2.7 miles of greater sage-grouse priority habitat Located north of U.S. Highway 40 and would avoid the Tuttle Ranch Conservation Easement and associated important sage-grouse and white-tailed prairie dog habitats recognized by CPW located on the easement	▪ 3.4 miles of greater sage-grouse habitat within 4 miles of leks located in priority habitats ▪ 0.9 mile greater sage-grouse general habitat ▪ 3.6 miles greater sage-grouse priority habitat Located north of U.S. Highway 40 and would avoid the Tuttle Ranch Conservation Easement and associated important sage-grouse and white-tailed prairie dog habitats recognized by CPW located on the easement

TABLE F-18
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS
FOR BIOLOGICAL RESOURCES

Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
	Colorado and a potential preferred location for the future release of black-footed ferrets (CPW 2013a).		
Environmental consequences (miles crossed)	3.2 miles of high impacts 3.3 miles of low impacts	4.1 miles of high impacts 2.4 miles of low impacts	4.5 miles of high impacts
Selective mitigation	5, 7, 12, and 13	5, 12, and 13	5, 12, and 13
Cumulative effects	■ Colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission project ■ Contribute to the existing effects on important and rare special status wildlife resources in the area; colocation with other infrastructure would help reduce these effects, but the value of habitats affected would be higher than Variation 1 or 2	■ Contribute to the existing effects on special status wildlife resources in the area ■ Line would be colocated with U.S. Highway 40, which has likely already modified wildlife habitats and behavior in the area	■ Contribute to the existing effects on special status wildlife resources in the area. ■ Located in an area with little preexisting disturbance; contribution to the incremental effects on special status wildlife would likely be greater than Variation 1.
Fish and Aquatics			
Affected environment	Alternative WYCO-B crosses intermittent streams and wetlands in the Deerlodge Road area, which could provide habitat for fish and other aquatic resources. However, no specific resources analyzed in detail in the EIS were identified in this area.	Similar to WYCO-B	Similar to WYCO-B
Environmental consequences	None	None	None
Selective mitigation	None	None	None
Cumulative effects	None	None	None
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

TABLE F-19
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Utility Corridors (miles)			
Designated (BLM and USFS)	1.9	0.2	0.2
West-wide Energy Corridor	1.6	0.2	0.2
Parallel Linear Facilities (miles)			
500kV	0.0	0.0	0.0
345kV	6.3	0.8	0.6
138kV	6.3	0.8	0.6
230kV	0.0	0.0	0.0
Pipeline	0.0	0.0	2.0
Existing Land Use			
Affected environment and consequences	No key impacts	No key impacts	Crosses 0.2 mile of residential land resulting in moderate residual impacts
Selective mitigation	None	None	7
Cumulative effects	None	None	The short-term cumulative effects of the Project in addition to past/present and Reasonably Foreseeable Future Actions (RFFAs) could potentially limit and/or alter access to existing residence(s) and noise may be produced during construction of the Project. Long-term cumulative effects could potentially restrict use of property where projects occur on private lands.
Authorized Land Use			
Affected environment and consequences	No key impacts	No key impacts	No key impacts
Selective mitigation	None	None	None
Future Land Use			
Affected environment and consequences	No key impacts	No key impacts	No key impacts
Selective mitigation	None	None	None
Cumulative effects	None	None	None
Zoning and General Plan Management Direction[1]			
Generalized permitting	No key permitting requirements	No key permitting requirements	No key permitting requirements
Selective mitigation	None	None	None

TABLE F-19
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

Note: [1]Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city or county. The generalized permitting is for disclosure and comparison only.

TABLE F-20
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Parks, Preservation, and Recreation			
Affected environment and consequences	No key impacts	No key impacts	No key impacts
Selective mitigation	None	None	None
Cumulative effects	None	None	None
Transportation and Access			
Affected environment	Crosses U.S. Highway 40 and other roadways	Crosses U.S. Highway 40, Deerlodge Road, and other roadways	Crosses U.S. Highway 40, Deerlodge Road, and other roadways
Environmental consequences	Moderate impacts are anticipated where temporary closures and/or delays would occur from construction of the project when crossing roadways (e.g., U.S. Highway 40). See Section 3.2.13 for more information.	Same as WYCO-B	Same as WYCO-B
Selective mitigation	5 and 9	5 and 9	5 and 9
Cumulative effects	Not applicable	Not applicable	Not applicable
Congressional Designations			
Affected environment and consequences	No key impacts	Crosses 0.2 mile of Dinosaur National Monument (Deerlodge Road). Crossing the monument would require a right-of-way permit be granted to the Applicant by the NPS prior to construction.	No key impacts

TABLE F-20 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS			
Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
		The crossing is inconsistent with the approved GMP, EIS, and ROD for the monument. A right-of-way will only be granted by NPS if there is no practicable alternative to such use of NPS lands per the NPS Director's Order 53.	
Selective mitigation	None	None	None
Cumulative effects	None	None	None
Special Designations and Other Management Areas			
Affected environment and consequences	Crosses 4.1 miles of the Tuttle Ranch and Cross Mountain Ranch conservation easements. The granting of easements or rights-of-way for transmission is prohibited. The only effective mitigation would be avoidance in lieu of amending the terms of the agreement.	Crosses 2.5 miles of the Tuttle Ranch and Cross Mountain Ranch conservation easements. The granting of easements or rights-of-way for transmission is prohibited. The only effective mitigation would be avoidance in lieu of amending the terms of the agreement.	Crosses 1.8 miles of the Cross Mountain Ranch Conservation Easement. The granting of easements or rights-of-way for transmission is prohibited. The only effective mitigation would be avoidance in lieu of amending the terms of the agreement.
Selective mitigation	None	None	None
Cumulative effects	Short-term cumulative effects of the Project, in addition to any past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions, and disturbance to the land in the right-of-way; long-term cumulative effects include additional industrial development in the conservation easement, which goes against the terms of the conservation easement	Short-term cumulative effects of the Project, in addition to any past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions, and disturbance to the lands in the right-of-way; long-term cumulative effects include additional industrial development in the conservation easement, which goes against the terms of the conservation easement	Short-term cumulative effects of the Project, in addition to any past and present actions and an RFFA proposed in this area, would be increased noise from construction equipment, limited access to a portion of the conservation easement during construction actions, and disturbance to the lands in the right-of-way; long-term cumulative effects include additional industrial development in the conservation easement, which goes against the terms of the conservation easement

TABLE F-20
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Lands with Wilderness Characteristics			
Affected environment and consequences	No key impacts	No key impacts	Crosses 1.6 miles of the Twelvemile Mesa inventoried lands with wilderness characteristics in the Little Snake field office. This alternative would cross the eastern portion of the unit, with remaining portion of the unit meeting the 5,000+ acre size requirement.
Selective mitigation	None	None	None
Cumulative effects	None	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas			
Affected environment and consequences	None	None	None
Selective mitigation	None	None	None
Cumulative effects	None	None	None
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

TABLE F-21
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Affected Environment			
Scenery (miles crossed)	▪ 0.7 mile of Class B ▪ 5.8 miles of Class C	▪ 2.5 miles of Class B ▪ 4.0 miles of Class C	▪ 3.6 miles of Class B ▪ 4.1 miles of Class C
High concern viewers (miles crossed)	▪ 0.0 mile of views within 0.5 mile ▪ 0.0 mile of views between 0.5 mile and 1.0 mile	▪ 2.4 miles of views within 0.5 mile ▪ 1.1 miles of views between 0.5 mile and 1.0 mile	▪ 2.8 miles of views within 0.5 mile ▪ 1.4 miles of views between 0.5 mile and 1.0 mile

TABLE F-21 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES			
Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
Moderate concern viewers (miles crossed)	▪ 2.6 miles of views within 0.5 mile – 2.6 ▪ 2.3 miles of views between 0.5 mile and 1.0 mile	▪ 6.5 miles of views within 0.5 mile ▪ V0.0 mile of views between 0.5 mile and 1.0 mile	▪ 4.2 miles of views within 0.5 mile ▪ 1.7 miles of views between 0.5 mile and 1.0 mile
Federal Agency Visual Management Objectives	▪ 1.6 miles of BLM VRM Class III	▪ None	▪ 1.5 miles of BLM VRM Class III
Environmental Consequences			
Scenery	No key impacts	No key impacts	Moderate impact on Class B scenery
Residences	No key impacts	▪ High impact on views from residences adjacent to Deerlodge Road and U.S. Highway 40	Similar to WYCO-B
Travel routes	No key impacts	▪ High impact on views from Deerlodge Road ▪ Moderate impact on views from U.S. Highway 40	Similar to WYCO-B
Recreation areas	No key impacts	High impact on views from Dinosaur National Monument associated primarily with the kiosk adjacent to U.S. Highway 40	High impact on views from Dinosaur National Monument associated primarily with the Deerlodge Road
Special designations	No key impacts	High impact on views from Dinosaur National Monument	Similar to WYCO-B
Selective mitigation	9	9	3, 4, 5, and 9
Cumulative effects	Colocation with existing lines consolidates impact on scenery with minimal effects on view from Deerlodge Road (Dinosaur National Monument)	More expansive area of scenery would be modified and increased cumulative effects on views from U.S. Highway 40 and Deerlodge Road	Due to separation from existing transmission lines, most expansive cumulative effects on scenery and increased impact on views from Deerlodge Road
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

TABLE F-22
DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)	Variation 1 Links C94, C93 (6.5 miles)	Variation 2 Links C94, C95 (7.7 miles)
Affected environment	▪ 14 sites identified by the Class I inventory ▪ One known site in the Project APE ▪ Unrecorded segment of the old Victory Highway crossed by Link C92 ▪ Key resources include the old Victory Highway and the Deerlodge Road; the Deerlodge Road is outside of the Project APE ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified	▪ 17 sites identified by the Class I inventory ▪ There are no known sites in the Project APE ▪ Unrecorded segments of the old Victory Highway crossed by Link C93 ▪ Same key resources as WYCO-B, except the Deerlodge Road is in the Project APE ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified	▪ 19 sites identified by the Class I inventory ▪ There are no known sites in the Project APE ▪ Unrecorded segment of the old Victory Highway crossed by Link C95 ▪ Same key resources as WYCO-B, except the Deerlodge Road is in the Project APE ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified
Environmental consequences	▪ 0.2 mile of high cultural resource intensity, except there is one historic linear site in the Project APE ▪ 0.2 mile of moderate cultural resource intensity ▪ 6.1 miles of low cultural resource intensity	Compared to WYCO-B, Variation 1 would include: ▪ 0.0 mile of high cultural resource intensity, except there is one historic linear site in the Project APE ▪ Same miles of moderate cultural resource intensity ▪ An additional 0.2 mile of low cultural resource intensity	Compared to WYCO-B, Variation 2 would include: ▪ 0.0 mile of high cultural resource intensity, except there is one historic linear site in the Project APE ▪ 0.0 mils of moderate cultural resource intensity ▪ An additional 1.6 miles of low cultural resource intensity
Selective mitigation	Specific mitigation measures for historic properties would be developed by the BLM in consultation with the consulting parties to the Programmatic Agreement, American Indian tribes, and the Applicant and implemented to mitigate any identified adverse impacts. These may include, but are not limited to, Project modifications and data recovery studies	Same as WYCO-B	Same as WYCO-B

TABLE F-22 DEERLODGE ROAD AREA – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES			
Focus of Comparison	**Alternative WYCO-B Links C92, C171, C173, C174 (6.5 miles)**	**Variation 1 Links C94, C93 (6.5 miles)**	**Variation 2 Links C94, C95 (7.7 miles)**
Cumulative effects	The addition of the Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources.	Same as WYCO-B	Same as WYCO-B
Plan Compliance			
Plan amendment (Yes or No)	No	No	No

Colorado-Utah Border

F.4 Colorado-Utah Border

This route variation area begins just east of the Colorado-Utah Border and ends south of the Bonanza Power Plant (Map F-4). In the Draft EIS, two alternative route options were presented in the area of the Colorado-Utah border: the route of Alternative COUT-C, the Agency Preferred Alternative (Links C188, U242, U280, U285 that are common to Alternatives COUT-C, COUT-H, and COUT-I), which heads to the southwest, and an alternative route (Links C187, U241, and U310 that are common to Alternatives COUT-A, COUT-B), which heads to the southwest then west. Based on review of the Draft EIS, the BLM White River Field Office (WRFO) requested that a route variation be analyzed to avoid crossing the Raven Ridge Area of Critical Environmental Concern (ACEC), avoid potential effects on sensitive plant species, and avoid effects on an area with a high potential for archaeological sites. In response WRFO's concerns, a route variation, Variation 1 (Links C187, U241, U260, U290) was developed and analyzed. Refer to Map F-4. The Applicant's technical analysis indicated that, along the route variation, the proposed transmission line would have to cross existing and/or the proposed TransWest Express transmission line several times; a condition that increases the possibility for outages caused by catastrophic events, thereby decreasing the reliability of the transmission lines. Also, the Applicant committed to moving the alignment to avoid crossing the Raven Ridge ACEC and committed to relocate the existing Bears Ears to Bonanza 345kV transmission line outside of the ACEC. Through further environmental analysis and discussion with the BLM WRFO and considering the Applicant's commitments to move the proposed and existing transmission line alignments, the WRFO concurred with the route of Alternative COUT-C, the Agency Preferred Alternative (Links C188, U242, U280, U285).

The lands crossed by the route of Alternative COUT-C (Agency Preferred Alternative) and Variation 1 are mostly administered by the BLM with isolated parcels of state-administered and privately owned lands. Primary resource issues in this area include: Uinta Basin hookless cactus core habitat, greater sage-grouse core habitat, Graham's and White River beardtongues, and views from Dinosaur National Monument.

Table F-23 is a comparison of substantive resource issues for each route variation. Table F-24 is a comparison of miles of each jurisdiction crossed by the route variations, and Table F-25 is a summary of estimated ground disturbance and vegetation clearing for the route variations. Tables F-26 to F-33 describe the inventory, impacts, and plan compliance for each resource in a comparison of route variations.

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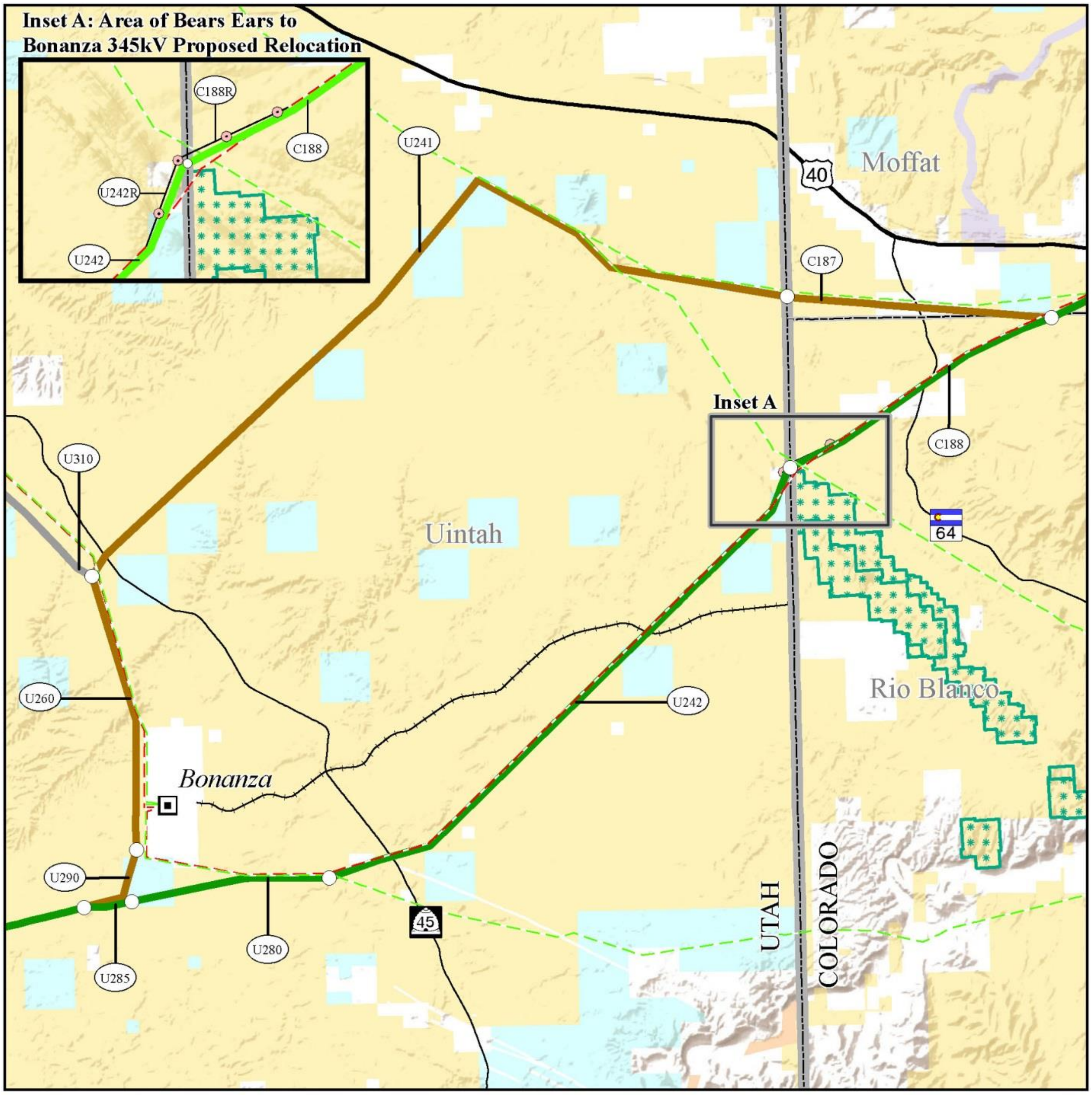

Map F-4

Colorado-Utah Border

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Project Features

- 🟩 Alternative COUT-C
- 🟫 Variation 1
- ▬ All Other Alternative Routes
- ⬭- Link Number
- ○ Link Node
- ⊙—⊙ 345kV Proposed Relocation (Inset A)

Land Ownership

- 🟨 Bureau of Land Management
- 🟪 National Park Service
- 🟦 State Land
- ☐ Private Land

General Reference

- ▣ Power Plant
- — — 345kV Transmission Line
- — — 138kV Transmission Line
- ┼┼┼┼ Railroad
- ▬ U.S. Highway
- — State Highway
- ☐ State Boundary
- ☐ County Boundary
- ✱ ✱ Raven Ridge ACEC

SOURCES:
Land Jurisdiction, BLM 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads, and Railroads, ESRI 2013;
State and County Boundaries, ESRI 2013;
Raven Ridge ACEC, BLM 2006

NOTES:

- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014

FINAL EIS: September 2015

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Miles

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TABLE F-23 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS BY RESOURCE		
Resource	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Climate and Air Quality	Due to the regional-scale of climate and air quality data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.1 for this alternative route.	Same as COUT-C
Earth Resources (miles crossed) (for detailed information, refer to able F-26)	▪ 23.5 miles of low flood hazard ▪ 1.2 miles of moderate landslide hazard ▪ 22.3 miles of low landslide hazard ▪ 1.6 miles of route is within one-mile of active mine or producing wells ▪ 1.0 mile of route crosses a coal lease ▪ 21.1 miles crosses oil and gas leases ▪ 0.1 mile of prime farmland ▪ 0.9 mile of soils with moderate susceptibility to water erosion	▪ 30.4 miles of low flood and landslide hazard ▪ 4.9 miles of route is within one-mile of active mine or producing wells ▪ 0.5 mile of route crosses a coal lease ▪ 21.5 miles oil and gas leases ▪ 0.1 mile of prime farmland ▪ 0.3 mile of soils with moderate susceptibility to water erosion ▪ 1.6 miles of soils with moderate susceptibility to wind erosion
Paleontological Resources (for detailed information, refer to Table F-27)	Crosses 3.5 miles of geological units with PFYC 3, 0.9 mile of geological units with PFYC 4, and 7.3 miles of geological units with PFYC 5	Crosses 1.4 miles of geological units with PFYC 3, 4.1 miles of geological units with PFYC 4, and 14.9 miles of geological units with PFYC 5
Water Resources (for detailed information, refer to Table F-28)	No critical issues	No critical issues
Biological Resources		
Vegetation (for detailed information, refer to Table F-29)	No critical issues	No critical issues

TABLE F-23 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS BY RESOURCE		
Resource	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Special Status Plants (for detailed information, refer to Table F-29)	Route would cross near known locations and potential habitat for BLM-sensitive and conservation agreement sensitive species near the Raven Ridge ACEC; the route variation also crosses potential habitat for Uinta Basin hookless cactus.	Route variation crosses potential Uinta Basin hookless cactus habitat as well as Uinta Basin hookless cactus Level 1 and Level 2 core areas. U.S. Fish and Wildlife Service (FWS) recommendations for management of cactus core areas include no new surface disturbance within Level 1 core areas and minimizing surface disturbance in Level 2 areas to 5 percent. The Bonanza Level 1 and Level 2 areas that would be crossed already exceed recommended disturbance caps. The Project may not be able to avoid all Uinta Basin hookless cactus locations in core areas. Compensatory mitigation and transplantation of Uinta Basin hookless cactus may be required.
Wildlife (for detailed information, refer to Table F-29)	No critical issues	No critical issues
Special Status Wildlife (for detailed information, refer to Table F-29)	16.0 miles of high impacts on greater sage-grouse core areas and black-footed ferret habitat	17.4 miles of high impacts on greater sage-grouse core areas and black-footed ferret habitat
Migratory Birds (for detailed information, refer to Table F-29)	Due to the regional-scale of migratory bird data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.9 for this alternative route.	Same as COUT-C
Fish and Aquatics (for detailed information, refer to Table F-29)	None	None
Land Use		
Land Use (for detailed information, refer to Table F-30)	None	None
Parks, Preservation, and Recreation (for detailed information, refer to Table F-31)	None	None
Transportation and Access (for detailed information, refer to Table F-31)	None	None
Congressional Designations (for detailed information, refer to Table F-31)	None	None
Special Designations and Other Management Areas (for detailed information, refer to Table F-31)	None	None

TABLE F-23 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS BY RESOURCE		
Resource	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Lands with Wilderness Characteristics (for detailed information, refer to Table F-31)	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas (for detailed information, refer to Table F-31)	None	None
Visual Resources (for detailed information, refer to Table F-32)	No key impacts	▪ Moderate impact on Class B scenery ▪ Moderate impact on views from residences in Dinosaur (Colorado), Dinosaur Diamond Scenic Byway (Colorado State Highway 64), and Dinosaur National Monument
Cultural Resources (for detailed information, refer to Table F-33)	▪ 268 sites identified by the Class I inventory; 13 known site in the Project APE ▪ 2.1 miles of high cultural resource intensity ▪ Key resources are an historic Ute rock art site, a large gilsonite mine complex, the Chipeta Wells Station, and the old Victory Highway; the gilsonite mine complex is in the Project APE	▪ 279 sites identified by the Class I inventory; 9 known site in the Project APE ▪ 1.3 miles of high cultural resource intensity ▪ Key resources are a Hopi sandstone cairn, the Chipeta Wells Station, and the old Victory Highway; these resources are outside of the Project APE
Fire Ecology and Management	Due to the regional-scale of fire ecology and management data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.21 for this alternative route.	Same as COUT-C
Social and Economic Conditions	Effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.22 for this alternative route.	Same as COUT-C
Public Health (EMF)	Due to the scale of public health data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.23 for this alternative route.	Same as COUT-C

TABLE F-24 COLORADO-UTAH BORDER – 500-KILOVOLT TRANSMISSION LINE PARALLEL CONDITIONS AND JURISDICTION BY ROUTE VARIATION		
Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Jurisdiction (miles crossed)		
BLM	20.2	24.1
USFS	0.0	0.0
NPS	0.0	0.0
State	2.2	4.3
Tribal	0.0	0.0
Private	1.1	2.0

TABLE F-25 COLORADO-UTAH BORDER – SUMMARY OF ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING FOR THE 500-KILOVOLT TRANSMISSION LINE AND SERIES COMPENSATION STATIONS		
Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Temporary disturbance (acres)[1, 4]	256	322
Permanent disturbance (acres)[2, 4]	78	106
Total disturbance (acres)	334	428
Transmission-line right-of-way vegetation clearing (acres)[3, 4]	6	51
Access Roads		
Existing (miles)[5]	18.3	22.6
New (miles)[6]	5.2	7.8

SOURCE: Assumptions for the calculations are derived from the Applicant's description of the Project (Appendix B).

NOTES:

[1] Temporary disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure), wire tensioning/pulling sites (250 by 400 feet; two every 3-5 miles), wire splicing sites (100 by 100 feet every 9,000 feet), multi-purpose construction yards (30-acre site located approximately every 20 miles), helicopter fly yards (15-acre site; located approximately every 5 miles), guard structures (150 by 75 feet; approximately 1.4 structures per 1 mile), and temporary access roads (refer to Table 2-1).

[2] Permanent disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (60 by 60 feet per structure), communication regeneration stations (100 by 100 feet, one station approximately every 55 miles), series compensation stations, and permanent access roads (refer to Tables 2-1 and 2-2).

[3] Right-of-way vegetation clearing: vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, mountain forest, mountain shrub, pinyon-juniper, and riparian), and overlap with other disturbance in the Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes and route variations at this time and is required to accurately identify locations of temporary and permanent access roads. Temporary and permanent disturbance calculations include estimated disturbance for all access roads.

[4] Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, columns may not sum exactly.

[5] Miles of the reference centerline that are anticipated to use existing and/or improved existing access roads.

[6] Miles of the reference centerline that are anticipated to use newly constructed and/or overland access.

ABLE F-26 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES		
Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Geologic Hazards		
Affected environment (miles crossed)	▪ 0.0 miles of mine subsidence ▪ 23.5 miles of low flood hazard ▪ 1.2 miles of moderate landslide hazard ▪ 22.3 miles of low landslide hazard	▪ 0.0 miles of mine subsidence ▪ 30.4 miles of low flood hazard ▪ 30.4 miles of low landslide hazard
Environmental consequences	Could have moderate susceptibility to landslides	Would only have low potential for impact from geological hazards
Selective mitigation	3	None
Cumulative effects	Could have incremental impacts on areas prone to landslides	None
Soil Resources		
Affected environment (miles crossed)	▪ 0.9 mile of soils with moderate susceptibility and 22.4 miles of soils with low susceptibility to water erosion ▪ 23.5 miles of soils with low susceptibility to wind erosion ▪ 0.1 mile of Prime or Unique Farmland	▪ 0.3 mile of soils with moderate susceptibility 30.1 miles of soils with low susceptibility to water erosion ▪ 1.6 miles of soils with moderate susceptibility and 28.8 miles of soils with low susceptibility to wind erosion ▪ 0.1 mile of Prime or Unique Farmland
Environmental consequences	More soils with moderate susceptibility to water erosion, but no soils with moderate susceptibility to wind erosion	Fewer soils with moderate susceptibility to water erosion, but more soils with moderate susceptibility to wind erosion
Selective mitigation	1, 3, 7, and 13	1, 3, 7, and 13
Cumulative effects	Could have incremental impacts on soils susceptible to wind and water erosion	Same as COUT-C
MineralResources		
Affected environment (miles crossed)	▪ 1.6 miles of the route are within 1.0 mile of active mines or producing wells ▪ 1.0 mile crosses a coal lease ▪ 21.1 miles crosses an oil and gas lease	▪ 4.9 miles of the route are within 1.0 mile of active mines or producing wells ▪ 0.5 mile crosses a coal lease ▪ 21.5 miles crosses an oil and gas lease
Environmental consequences	Highest impact on mineral resources	Lowest impact on mineral resources
Selective mitigation	2 and 7	2 and 7
Cumulative effects	Could have incremental impacts on leases and producing wells	Same as COUT-C
Plan Compliance		
Plan amendment	No	No

TABLE F-27
COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)	Variation 1 Links C187, U241, U260, U290 (30.4 miles)
Affected Environment		
PFYC (miles crossed)	▪ 11.8 miles of PFYC 2 ▪ 3.5 miles of PFYC 3 ▪ 0.9 mile of PFYC 4 ▪ 7.3 miles of PFYC 5	▪ 10.0 miles of PFYC 2 ▪ 1.4 miles of PFYC 3 ▪ 4.1 miles of PFYC 4 ▪ 14.9 miles of PFYC 5
Known locality density within 1.0 mile of the centerline (miles crossed)	▪ 26.8 miles of low density for fossil localities ▪ 3.4 miles of moderate density for fossil localities	▪ 21.6 miles of low density for fossil localities ▪ 1.9 miles of moderate density for fossil localities
Environmental Consequences		
PFYC formations (miles crossed)	Crosses 11.7 miles of geological units with PFYC 3, 4, or 5	Crosses 20.4 miles of geological units with PFYC 3,4, or 5
Percent of route crossing PFYC 3, 4, and 5	50	67
Impacts on paleontological resources anticipated	Lower impacts then Variation 1	Crosses twice as many miles with PFYC 4 and 5 than COUT-C
Selective mitigation	None	None
Cumulative effects	Could have incremental impacts on paleontological resources	Same as COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-28
COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)	Variation 1 Links C187, U241, U260, U290 (30.4 miles)
Affected Environment		
Class 1: Outstanding waters	None	None
Class 4: State-listed impaired waters	10 crossings	5 crossings
Palustrine emergent wetlands	None	2 crossings
Palustrine forested overstory wetlands	None	None
Palustrine scrub/shrub wetlands	None	None
Perennial stream/river	None	1 crossing
Intermittent stream	39 crossings	33 crossings
Riparian areas	None	None
Swamp/marsh/estuary	None	None
Well/spring	None	None

TABLE F-28 **COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES**		
Focus of Comparison	**Alternative COUT-C** **Links C188, U242, U280, U285** **(23.5 miles)**	**Variation 1** **Links C187, U241, U260, U290** **(30.4 miles)**
Environmental Consequences		
Residual Impacts (miles crossed)	8.8 miles of low impacts	▪ 0.2 mile of moderate impacts ▪ 8.5 miles of low impacts
Selective mitigation	1, 2, 7, and 11	1, 2, 7, and 11
Cumulative effects	▪ Would be colocated with existing high-voltage transmission lines ▪ Minor, incremental contribution to the effects on water resources in the area; colocation with other infrastructure would reduce these effects as it would reduce road construction and resulting potential for sedimentation	▪ Colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission line ▪ Minor, incremental contribution to the effects on water resources in the area; colocation with other infrastructure would reduce these effects as it would reduce road construction and resulting potential for sedimentation
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-29 **COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES**		
Focus of Comparison	**Alternative COUT-C** **Links C188, U242, U280, U285** **(23.5 miles)**	**Variation 1** **Links C187, U241, U260, U290** **(30.4 miles)**
Vegetation		
Affected environment (miles crossed)	▪ 0.6 mile of barren ▪ 11.7 miles of big sagebrush ▪ 0.2 mile of developed ▪ 3.1 miles of invasive ▪ 0.2 mile od pinyon-juniper ▪ 7.6 miles of shrub/shrub steppe ▪ 0.1 mile of water	▪ 1.0 mile of barren ▪ 18.7 miles of big sagebrush ▪ 0.1 mile of grassland ▪ 3.5 miles of invasive ▪ 1.6 miles of pinyon-juniper ▪ 5.5 miles of shrub/shrub steppe
Environmental consequences (miles crossed)	▪ 12.4 miles of moderate impacts ▪ 7.8 miles of low-moderate impacts ▪ 3.3 miles of low impacts	▪ 19.9 miles of moderate impacts ▪ 7.1 miles of low-moderate impacts ▪ 3.5 miles of low impacts
Selective mitigation	▪ 1, 2, 4, and 7	▪ None

TABLE F-29 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES		
Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Cumulative effects	▪ Colocated with existing high-voltage transmission lines ▪ Minor, incremental contribution to the effects on vegetation resources in the area; colocation with other infrastructure would reduce these effects as it would reduce road construction and resulting surface disturbance	▪ Colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission line ▪ Minor, incremental contribution to the effects on vegetation resources in the area; colocation with other infrastructure would reduce these effects as it would minimize road construction and resulting surface disturbance
Special Status Plants		
Affected environment (miles crossed)	▪ 0.4 mile of Graham's penstemon potential habitat ▪ 3.4 miles of Uinta Basin hookless cactus potential habitat ▪ 0.4 mile of White River penstemon potential habitat ▪ BLM-sensitive and species covered by BLM conservation agreements are known to be present in the area around the Raven Ridge ACEC near the Colorado/Utah border.	▪ 6.0 miles of Uinta Basin hookless cactus potential habitat ▪ 1.0 mile of Uinta Basin hookless cactus level 1 core area ▪ 2.5 miles of Uinta Basin hookless cactus level 2 core area
Environmental consequences (miles crossed)	▪ 3.8 miles of low residual impacts ▪ Special status plant surveys would be required to determine the potential effects on BLM-sensitive plants near the Raven Ridge ACEC.	▪ 1.0 mile of moderate impacts ▪ 5.0 miles of low impacts ▪ The route would cross Uinta Basin hookless cactus Level 1 and Level 2 core areas. FWS recommenda-tions for management of cactus core areas include no new surface disturbance within Level 1 core areas and minimizing surface disturbance in Level 2 areas to 5 percent. The Bonanza Level 1 and Level 2 areas that would be crossed already exceed recommended disturbance caps.
Selective mitigation	2, 5, and 7	2, 5, and 7

TABLE F-29
COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Cumulative effects	▪ Would contribute to the existing effects of oil and gas development and existing transmission lines on Uinta Basin hookless cactus, White River penstemon, and Graham's penstemon potential habitats; colocation with existing infrastructure would help reduce these effects as it would reduce road construction and resulting surface disturbance	▪ Would contribute to the existing effects of oil and gas development and existing transmission lines on Uinta Basin hookless cactus core areas ▪ Surface disturbance in core areas would be required and it is anticipated that not all cacti locations could be avoided ▪ FWS recommendations for management of cactus core areas include no new surface disturbance within Level 1 core areas and minimizing surface disturbance in Level 2 areas to 5 percent; Bonanza Level 1 and Level 2 areas that would be crossed already exceed recommended disturbance caps
Wildlife		
Affected environment (miles crossed)	▪ 4.1 miles of mule deer crucial winter range ▪ 6.7 miles of pronghorn crucial yearlong range ▪ 16.7 miles of pronghorn fawning areas	▪ 8.6 miles of mule deer crucial winter range ▪ 23.8 miles of pronghorn crucial yearlong range ▪ 23.8 miles of pronghorn fawning areas
Environmental consequences	20.6 miles of low residual impacts	30.4 miles of low residual impacts
Selective mitigation	12 and 15	12 and 15
Cumulative effects	▪ Would be colocated with existing high-voltage transmission lines ▪ Minor, incremental contribution to the effects on wildlife in the area; colocation with other infrastructure would reduce these effects as it would reduce road construction and resulting surface disturbance	▪ Colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission line ▪ Minor, incremental contribution to the effects on wildlife in the area; colocation with other infrastructure would reduce these effects as it would minimize road construction and resulting surface disturbance

TABLE F-29
COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)	Variation 1 Links C187, U241, U260, U290 (30.4 miles)
Special Status Wildlife		
Affected environment (miles crossed)	▪ 7.5 mile of black-footed ferret potential habitat ▪ 9.7 miles of mountain plover potential habitat ▪ 6.4 miles of white-tailed prairie dog potential colonies ▪ 3.0 miles of greater sage-grouse habitat within 4 miles of leks in priority habitat ▪ 6.0 miles of greater sage-grouse general habitat ▪ 16.0 miles of greater sage-grouse priority habitat	▪ 6.1 miles of black-footed ferret potential habitat ▪ 6.6 miles of mountain plover potential habitat ▪ 5.8 miles of white-tailed prairie dog potential colonies ▪ 2.4 miles of greater sage-grouse habitat within 4 miles of leks in priority habitat ▪ 5.3 miles of greater sage-grouse general habitat ▪ 11.3 miles of greater sage-grouse priority habitat
Environmental consequences (miles crossed)	▪ 16.0 miles of high residual impacts ▪ 1.3 miles of moderate residual impacts ▪ 5.9 miles of low residual impacts	▪ 17.4 miles of high residual impacts ▪ 3.8 miles of moderate residual impacts ▪ 4.1 miles of low residual impacts
Selective mitigation	5, 7, 12, 13 and 15	5, 7, 12, 13 and 15
Cumulative effects	▪ Colocated with existing high-voltage transmission lines ▪ Minor, incremental contribution to the effects on special status wildlife in the area; colocation with other infrastructure would reduce these effects as it would reduce road construction and resulting surface disturbance	▪ Colocated with existing high-voltage transmission lines and the proposed TransWest Express transmission line ▪ Incremental contribution to the effects on special status wildlife in the area; colocation with other infrastructure would reduce these effects as it would minimize road construction and resulting surface disturbance
Fish and Aquatics		
Affected environment	No specific resources analyzed in detail in the EIS were identified in this area.	Same as COUT-C
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-30 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION		
Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Utility Corridors (miles)		
Designated (BLM and USFS)	0.6	3.2
West-wide Energy Corridor	0.0	10.6
Parallel Linear Facilities (miles)		
500kV	0.0	0.0
345kV	21.0	7.6
138kV	4.1	18.8
230kV	0.0	0.0
Pipeline	0.7	3.9
Existing Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Authorized Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Future Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Zoning and General Plan Management Direction[1]		
Generalized permitting	No key permitting requirements	No key permitting requirements
Selective mitigation	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No
NOTE: [1]Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city or county. The generalized permitting is for disclosure and comparison only.		

TABLE F-31 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; CONGRESSIONAL DESIGNATIONS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS		
Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Parks, Preservation, and Recreation areas		
Affected environment and consequences	Crosses 0.4 mile of scenic byway. See visual resources in the Final EIS for more details.	Crosses 0.1 mile of scenic byway. See visual resources in the Final EIS for more details.
Selective mitigation	None	None
Cumulative effects	None	None
Transportation and Access		
Affected environment	Crosses Colorado State Highway 64, Utah State Route 45, and other roadways.	Crosses Colorado State Highway 64, Utah State Route 45, and other roadways.
Environmental consequences	Moderate impacts would be anticipated where temporary closures and/or delays would occur from construction of the project when crossing roadways (e.g. Colorado State Highway 64). See Section 3.2.13 for more information.	Same as COUT-C
Selective mitigation	5 and 9	5 and 9
Cumulative effects	Not applicable	Not applicable
Congressional Designations		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Special Designations and Other Management Areas		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Lands with Wilderness Characteristics		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas		
Affected environment	None	None
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment	No	No

TABLE F-32 COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES		
Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Affected Environment		
Scenery (miles crossed)	▪ 0.8 mile of Class B ▪ 22.7 miles of Class C	▪ 4.3 miles of Class B ▪ 26.1 miles of Class C
High concern viewers (miles crossed)	▪ 1.0 mile of views within 0.5 mile ▪ 0.9 mile of views between 0.5 mile and 1.0 mile	▪ 1.0 mile of views within 0.5 mile ▪ 0.9 mile of views between 0.5 mile and 1.0 mile
Moderate concern viewers (miles crossed)	▪ 1.6 miles of views within 0.5 mile ▪ 1.5 miles of views between 0.5 mile and 1.0 mile	▪ 1.2 miles of views within 0.5 mile ▪ 1.6 miles of views between 0.5 mile and 1.0 mile
Federal Agency Visual Management Objectives	▪ 1.2 miles of BLM VRM Class II ▪ 13.7 miles of BLM VRM Class III ▪ 5.2 miles of BLM VRM Class IV	▪ 9.5 miles of BLM VRM Class III ▪ 14.6 miles of BLM VRM Class IV
Environmental Consequences		
Scenery	No key impacts	Moderate impact on Class B scenery
Residences	No key impacts	Moderate impact on views from residences in Dinosaur, Colorado
Travel routes	No key impacts	Moderate impact on views from Dinosaur Diamond Scenic Byway (Colorado State Highway 64)
Recreation areas	No key impacts	No key impacts
Special designations	No key impacts	Moderate impact on views from Dinosaur National Monument (Canyon Visitor Center)
Selective mitigation	9	3, 4, 9, and 16
Cumulative effects	Consolidates impacts on scenery adjacent to similar types of modification and reduced cumulative effects on views from Dinosaur National Monument	Colocation with the TransWest Express transmission project would introduce additional impacts on scenery and would increasingly modify views from Dinosaur National Monument
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-33
COLORADO-UTAH BORDER – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	**Alternative COUT-C Links C188, U242, U280, U285 (23.5 miles)**	**Variation 1 Links C187, U241, U260, U290 (30.4 miles)**
Affected environment	▪ 268 sites identified by the Class I inventory (30 sites in Colorado and 239 in Utah) ▪ 13 known sites in the Project APE (5 sites in Colorado and 8 in Utah) ▪ Key resources include an historic Ute rock art site, a large gilsonite mine complex, the Chipeta Wells Station, and the old Victory Highway; the gilsonite mine complex is crossed by Link U280 (Utah) ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified	▪ 279 sites identified by the Class I inventory (16 sites in Colorado and 263 in Utah) ▪ Nine known site in the Project APE (1 site in Colorado and 8 in Utah) ▪ Key resources include a Hopi sandstone cairn, the Chipeta Wells Station, and the old Victory Highway; these resources are outside of the Project APE ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified
Environmental consequences	▪ 2.1 miles of high cultural resource intensity ▪ 1.2 miles of moderate cultural resource intensity ▪ 20.2 miles of low cultural resource intensity	▪ 1.3 miles of high cultural resource intensity. ▪ 7.1 miles of moderate cultural resource intensity ▪ 22 miles of low cultural resource intensity
Selective mitigation	Specific mitigation measures for historic properties would be developed by the BLM in consultation with the consulting parties to the Programmatic Agreement, American Indian tribes, and the Project Applicant and implemented to mitigate any identified adverse impacts. These may include, but are not limited to, Project modifications and data recovery studies	Same as COUT-C
Cumulative effects	The addition of the Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources	Same as COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	No

Argyle Ridge

F.5 Argyle Ridge

This route variation area is located 20 miles northeast of Helper, Utah, approximately 5 miles up Argyle Canyon from Ninemile Canyon (Map F-5).

The Draft EIS presented a route (Link U407) that crosses Argyle Ridge, descends into and west through Argyle Canyon then exits the canyon and proceeds southwest. As the Applicant's engineers were reviewing Link U407, it was determined that would be feasible to cross over the canyon to the south and proceed east through mountainous terrain, thereby avoiding disturbance in Argyle Canyon (Link U413).

The lands crossed by the route of Alternative COUT-C (the Agency Preferred Alternative) and Variation 1 are a mixture of BLM-, state-administered, and privately owned lands. Primary resource issues in this area include views from residences in Argyle Canyon, impacts on Class A (Argyle Canyon) scenery, special status plant potential habitat, Mexican spotted owl potential habitat, and non-compliance with BLM VRM Class III objectives.

Table F-34 is a comparison of substantive resource issues for each route variation. Table F-35 is a comparison of miles of each jurisdiction crossed by the route variations, and Table F-36 is a summary of estimated ground disturbance and vegetation clearing for the route variations. Tables F-37 to F-44 describe the inventory, impacts, and plan compliance for each resource in a side-by-side comparison of route variations.

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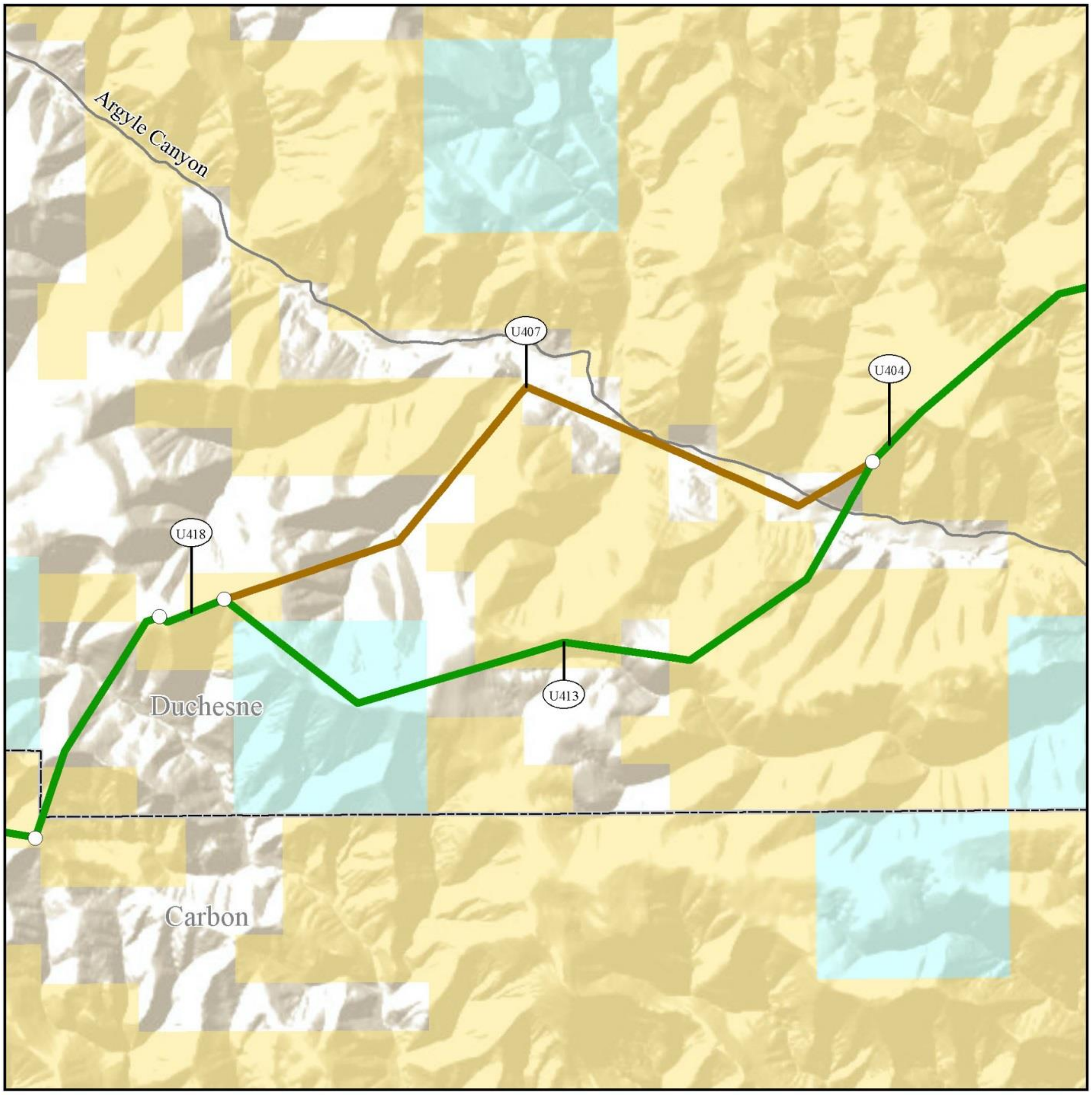

Map F-5

Argyle Ridge

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Project Features

- 🟩 Alternative COUT-C
- 🟫 Variation 1
- ⬭ Link Number
- ○ Link Node

Land Ownership

- 🟨 Bureau of Land Management
- 🟦 State Land
- ☐ Private Land

General Reference

- — Other Road
- ☐ County Boundary

SOURCES:
Land Jurisdiction, BLM 2013;
Highways, Roads, and Railroads, ESRI 2013;
County Boundaries, ESRI 2013

NOTES:
- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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Miles

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TABLE F-34
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Climate and Air Quality	Due to the regional-scale of climate and air quality data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.1 for this alternative route.	Same as COUT-C
Earth Resources (miles crossed) (for detailed information, refer to Table F-37)	▪ 3.7 miles of oil and gas leases ▪ 2.9 miles of moderate landslide susceptibility	▪ 3 miles of oil and gas leases ▪ 2.8 miles of moderate landslide susceptibility
Paleontological Resources (for detailed information, refer to Table F-38)	Entire route crosses area with PFYC 4	Entire route crosses area with PFYC 4
Water Resources (for detailed information, refer to Table F-39)	No critical issues	No critical issues
Biological Resources		
Vegetation (for detailed information, refer to Table F-40)	No critical issues	No critical issues
Special Status Plants (for detailed information, refer to Table F-40)	Crosses Grahams and White River penstemon potential habitat and would be located in Argyle Canyon, which may contain suitable habitat for Ute ladies' tresses.	Argyle Canyon would likely be spanned, which may contain suitable habitat for Ute ladies' tresses.
Wildlife (for detailed information, refer to Table F-40)	No critical issues	No critical issues
Special Status Wildlife (for detailed information, refer to Table F-40)	Moderate impacts on Mexican spotted owl potential habitat	Similar to COUT-C
Migratory Birds (for detailed information, refer to Table F-40)	Due to the regional-scale of migratory bird data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.9 for this alternative route.	Same as COUT-C
Fish and Aquatics (for detailed information, refer to Table F-40)	No critical issues	No critical issues

TABLE F-34
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	**Alternative COUT-C Link U413 (4.1 miles)**	**Variation 1 Link U407 (4.0 miles)**
Land Use		
Land Use (for detailed information, refer to Table F-41)	None	Crosses 0.8 mile of irrigated farmland resulting in a moderate impact.
Parks, Preservation, and Recreation (for detailed information, refer to Table F-42)	None	None
Transportation and Access (for detailed information, refer to Table F-42)	None	None
Congressional Designations (for detailed information, refer to Table F-42)	None	None
Special Designations and Other Management Areas (for detailed information, refer to Table F-42)	None	None
Lands with Wilderness Characteristics (for detailed information, refer to Table F-42)	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas (for detailed information, refer to Table F-42)	None	None
Visual Resources (for detailed information, refer to Table F-43)	▪ High impact on Class A (Argyle Canyon) and Class B scenery ▪ High impact on views from residence in Argyle Canyon, Argyle Canyon Road, and the western edge of Nine Mile Canyon ACEC	▪ Additional high impact on Class A scenery (Argyle Canyon) ▪ Longer duration high impact on views from residence in Argyle Canyon and Argyle Canyon Road ▪ One plan amendment (VFO4)
Cultural Resources (for detailed information, refer to Table F-44)	▪ No sites identified by the Class I inventory ▪ Crosses 0.0 mile of high cultural resource intensity ▪ Key resources include Argyle Canyon Rock Art (Archaeological Sites) and Nine Mile Canyon ACEC; Argyle Canyon Rock Art (Archaeological Sites) is in the Project APE ▪ High potential for encountering numerous unrecorded archaeological sites (e.g., rock art, granaries, ceremonial sites, and habitations) and historic coal mining sites along Argyle Canyon and the vicinity of Nine Mile Canyon	Same as COUT-C

TABLE F-34
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Fire Ecology and Management	Due to the regional-scale of fire ecology and management data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.21 for this alternative route.	Same as COUT-C
Social and Economic Conditions	Effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.22 for this alternative route.	Same as COUT-C
Public Health (EMF)	Due to the scale of public health data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.23 for this alternative route.	Same as COUT-C

TABLE F-35
ARGYLE RIDGE – 500-KILOVOLT TRANSMISSION LINE PARALLEL CONDITIONS AND JURISDICTION BY ROUTE VARIATION

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Jurisdiction (miles crossed)		
BLM	2.0	1.5
USFS	0.0	0.0
NPS	0.0	0.0
State	1.1	0.0
Tribal	0.0	0.0
Private	1.0	2.4

TABLE F-36
ARGYLE RIDGE – SUMMARY OF ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING FOR THE 500-KILOVOLT TRANSMISSION LINE AND SERIES COMPENSATION STATIONS

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Temporary disturbance (acres)[1, 4]	39	38
Permanent disturbance (acres)[2, 4]	41	47
Total disturbance (acres)	80	85
Transmission-line right-of-way vegetation clearing (acres)[3, 4]	70	67
Access Roads		
Existing (miles)[5]	3.1	2.4
New (miles)[6]	1.0	1.6

SOURCE: Assumptions for the calculations are derived from the Applicant's description of the Project (Appendix B).

NOTES:

[1] Temporary disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure), wire tensioning/pulling sites (250 by 400 feet; two every 3-5 miles), wire splicing sites (100 by 100 feet every 9,000 feet), multi-purpose construction yards (30-acre site located approximately every 20 miles), helicopter fly yards (15-acre site; located approximately every 5 miles), guard structures (150 by 75 feet; approximately 1.4 structures per 1 mile), and temporary access roads (refer to Table 2-1).

[2] Permanent disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (60 by 60 feet per structure), communication regeneration stations (100 by 100 feet, one station approximately every 55 miles), series compensation stations, and permanent access roads (refer to Tables 2-1 and 2-2).

[3] Right-of-way vegetation clearing: vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, mountain forest, mountain shrub, pinyon-juniper, and riparian), and overlap with other disturbance in the Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes and route variations at this time and is required to accurately identify locations of temporary and permanent access roads. Temporary and permanent disturbance calculations include estimated disturbance for all access roads.

[4] Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, columns may not sum exactly.

[5] Miles of the reference centerline that are anticipated to use existing and/or improved existing access roads.

[6] Miles of the reference centerline that are anticipated to use newly constructed and/or overland access.

TABLE F-37 ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES		
Focus of Comparison	**Alternative COUT-C Link U413 (4.1 miles)**	**Variation 1 Link U407 (4.0 miles)**
Geologic Hazards		
Affected environment	▪ Crosses no mine subsidence ▪ Crosses low flood hazard ▪ Crosses 2.9 miles of moderate landslide susceptibility	▪ Crosses no mine subsidence ▪ Crosses low flood hazard ▪ Crosses 2.8 miles of moderate landslide susceptibility
Environmental consequences	Mostly low or moderate impacts	Same as COUT-C
Selective mitigation	3	3
Cumulative effects	Could be incremental impacts on areas prone to landslides	Same as COUT-C
Soil Resources		
Affected environment (mile crossed)	▪ No water erosion ▪ Crosses 4.1 miles of low susceptibility to wind erosion ▪ No Prime or Unique Farmland	▪ No water erosion ▪ Crosses 4.0 miles of low susceptibility to wind erosion ▪ No Prime or Unique Farmland
Environmental consequences	Low impacts on soil resources	Low impacts on soil resources
Selective mitigation	1, 3, 7, and 11	1, 3, 7, and 11
Cumulative effects	None	None
Mineral Resources		
Affected environment	▪ Crosses no active mines or producing wells ▪ Crosses 3.7 miles of oil and gas leases	▪ Crosses no active mines or producing wells ▪ Crosses 3 miles of oil and gas leases
Environmental consequences	Low impacts on mineral resources	Low impacts on mineral resources
Selective mitigation	None	None
Cumulative effects	There could be incremental impacts on oil and gas leases	Same as COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-38 ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES		
Focus of Comparison	**Alternative COUT-C Link U413 (4.1 miles)**	**Variation 1 Link U407 (4.0 miles)**
Affected Environment		
PFYC formations (miles crossed)	4.1 miles with PFYC 4	4.0 miles with PFYC 4
Known locality density within 1.0 mile of the centerline	Low	Low

TABLE F-38
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Environmental Consequences		
PFYC formations (miles crossed)	Entire route crosses area with PFYC of 4	Entire route crosses area with PFYC of 4
Percent of route crossing PFYC 4	100	100
Impacts on paleontological resources anticipated	Impacts could be high	Impacts could be high
Selective mitigation	None	None
Cumulative effects	There could be incremental impacts on paleontological resources	Same as COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-39
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Affected Environment		
Class 1: Outstanding waters	None	None
Class 4: State-listed impaired waters	None	None
Palustrine emergent wetlands	1 crossing	2 crossings
Palustrine forested overstory wetlands	None	None
Palustrine scrub/shrub wetlands	None	None
Perennial stream/river	1 crossing	1 crossing
Intermittent stream	None	8 crossings
Riparian areas	None	None
Swamp/marsh/estuary	None	None
Well/spring	None	None
Environmental Consequences		
Residual impacts (miles crossed)	0.1 mile of moderate impacts 0.6 mile of low impacts	0.2 mile of moderate impacts 1.7 miles of low impacts
Selective mitigation	None	None
Cumulative effects	▪ Vicinity of perennial water resources in Argyle Canyon ▪ Could also be affected by the proposed TransWest Express transmission line and existing agricultural development ▪ Minor incremental impact on water resources in the area	▪ Would likely span Argyle Canyon and the perennial water resources located in the canyon; incremental impact of the Project on these resources would be minimal or would not occur

TABLE F-39
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS
FOR WATER RESOURCES

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-40
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS
FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Vegetation		
Affected environment (miles of vegetation communities crossed)	▪ 0.1 mile of alpine ▪ 0.8 mile of aspen ▪ 0.2 mile of barren ▪ 1.2 miles of big sagebrush ▪ 0.3 mile of grassland ▪ 0.1 mile of montane forest ▪ 0.1 mil of mountain shrub ▪ 1.2 mile of pinyon-juniper ▪ 0.1 mile of wetland	▪ 1.2 miles of agriculture ▪ 0.2 mile of alpine ▪ 0.1 mile of aspen ▪ 0.3 mile of big sagebrush ▪ 0.1 mile of grassland ▪ 1.2 miles of montane forest ▪ 0.3 mile of mountain shrub ▪ 0.5 mile of pinyon-juniper ▪ 0.1 mile of wetland
Environmental consequences (miles crossed)	▪ 2.9 miles of moderate impacts ▪ 1.2 miles of low-moderate impacts	▪ 2.3 miles of moderate impacts ▪ 0.5 mile of low-moderate impacts ▪ 1.2 miles of low impacts
Selective mitigation	1, 2, 4, and 7	1, 2, 4, and 7
Cumulative effects	The Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on vegetation in the area.	The Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on vegetation in the area.
Special Status Plants		
Affected environment (miles crossed)	▪ 1.3 miles of Grahams penstemon potential habitat ▪ 1.3 miles of White River penstemon potential habitat ▪ Wetlands in Argyle Canyon may provide suitable habitat for Ute ladies'-tresses; however, these resources were not identified as directly crossed in this area based on the methods used to conduct the EIS analysis	▪ No identifiable special status plant habitat crossed based on the methods used to conduct the EIS analysis. ▪ Wetlands in Argyle Canyon may provide suitable habitat for Ute ladies tresses
Environmental consequences	Crosses 1.3 miles of low residual impacts	None identified using the methods used to analyze impacts in the EIS.
Selective mitigation	2 and 7	None

TABLE F-40
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Cumulative effects	▪ Vicinity of potential Ute ladies' tresses habitat in Argyle Canyon ▪ Could be affected by the proposed TransWest Express transmission line and existing agricultural development ▪ Minor incremental impact on these habitats and habitats for other special status plants	▪ Likely span Argyle Canyon and the potential special status plant habitats located in the canyon; incremental impact of the project on these resources would be minimal or would not occur
Wildlife		
Affected environment (miles crossed)	▪ 3.3 miles of elk crucial winter range ▪ 3.7 miles of moose crucial winter range ▪ 3.2 miles of mule deer crucial winter range	▪ 1.0 mile of elk crucial winter range ▪ 3.8 miles of moose crucial winter range ▪ 0.5 mile of mule deer crucial winter range
Environmental consequences (miles crossed)	3.7 miles of low impacts	3.8 miles of low impacts
Selective mitigation	12 and 15	12 and 15
Cumulative effects	Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on wildlife in the area	Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on wildlife in the area
Special Status Wildlife		
Affected environment (miles crossed)	2.7 miles of Mexican spotted owl potential habitat	4.0 miles of Mexican spotted owl potential habitat
Environmental consequences (miles crossed)	2.7 miles of moderate impacts	4.0 miles of moderate impacts
Selective mitigation	2, 4, 5, 7, and 12	2, 4, 5, 7, and 12
Cumulative effects	Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on Mexican spotted owl habitat	Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on Mexican spotted owl habitat
Fish and Aquatics		
Affected environment	No specific resources analyzed in detail in the EIS were identified in this area. However, water resources present in the area may provide habitats for fish and aquatic resources.	Same as COUT-C
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-41 ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION		
Focus of Comparison	**Alternative COUT-C Link U413 (4.1 miles)**	**Variation 1 Link U407 (4.0 miles)**
Utility Corridors (miles)		
Designated (BLM and USFS)	0.0	0.0
West-wide Energy Corridor	0.0	0.0
Parallel Linear Facilities (miles)		
500kV	0.0	0.0
345kV	0.0	0.0
138kV	0.0	0.0
230kV	0.0	0.0
Pipeline	0.0	0.0
Existing Land Use		
Affected environment and consequences	No key impacts	Crosses 0.8 mile of irrigated farmland resulting in a moderate residual impact
Selective mitigation	None	11
Cumulative effects	None	The short-term cumulative effects, in addition to the past and present actions and RFFAs, potential for limited access to fields or agriculture operations during construction. The long-term cumulative effects would be utility and industrial infrastructure that potentially could reduce the amount of and/or alter agriculture production lands.
Authorized Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Future Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Zoning and General Plan Management Direction[1]		
Generalized permitting	No permitting requirements	No permitting requirements
Selective mitigation	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No
NOTES: [1]Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city or county. The generalized permitting is for disclosure and comparison only.		

TABLE F-42
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS
FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; CONGRESSIONAL DESIGNATIONS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Parks, Preservation, and Recreation		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Transportation and Access		
Affected environment	Crosses Argyle Canyon Road and other roadways	Crosses Argyle Canyon Road and other roadways
Environmental consequences	Anticipate moderate impacts where temporary closures and/or delays would occur from construction of the Project when crossing roadways (e.g. Argyle Canyon Road). See Section 3.2.13 for more information.	Same as COUT-C
Selective mitigation	5 and 9	5 and 9
Cumulative effects	Not applicable	Not applicable
Congressional Designations		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Special Designations and Other Management Areas		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Lands with Wilderness Characteristics		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas		
Affected environment	None	None
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-43
ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U413 (4.1 miles)	Variation 1 Link U407 (4.0 miles)
Affected Environment		
Scenery (miles crossed)	▪ 0.7 mile of Class A ▪ 3.4 miles of Class B	▪ 2.3 miles of Class A ▪ 1.7 miles of Class B
High concern viewers (miles crossed)	▪ 0.3 mile of views within 0.5 mile ▪ 1.7 mile of views between 0.5 mile and 1.0 mile	▪ 1.3 miles of views within 0.5 mile ▪ 1.1 miles of views between 0.5 mile and 1.0 mile
Moderate concern viewers (miles crossed)	▪ 0.8 mile of views within 0.5 mile ▪ 0.6 mile of views between 0.5 mile and 1.0 mile	▪ 2.3 miles of views within 0.5 mile ▪ 0.7 mile of views between 0.5 mile and 1.0 mile
Federal Agency Visual Management Objectives	2.0 miles of BLM VRM Class III	1.7 miles of BLM VRM Class III
Environmental Consequences		
Scenery	High impact on Class A (Argyle Canyon) and Class B scenery	Additional high impacts on Class A scenery (Argyle Canyon)
Residences	High impact on views from residence in Argyle Canyon	Longer duration high impact on view from residence in Argyle Canyon
Travel routes	High impact on views from Argyle Canyon Road	Longer duration high impact on views from Argyle Canyon Road
Recreation areas	No key impacts	No key impacts
Special designations	High impact on views from Nine Mile Canyon ACEC	Similar to COUT-C
Selective mitigation	3, 4, and 5	3, 4, and 5
Cumulative effects	Colocation with the TransWest Express transmission line would consolidate effects on scenery and on views	Similar to COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	Yes, VFO4

TABLE F-44 ARGYLE RIDGE – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES		
Focus of Comparison	**Alternative COUT-C Link U413 (4.1 miles)**	**Variation 1 Link U407 (4.0 miles)**
Affected environment	▪ No sites were identified by the Class I inventory. ▪ There are no known sites in the Project APE ▪ Key resources include Argyle Canyon Rock Art (Archaeological Sites) and Nine Mile Canyon ACEC; Argyle Canyon Rock Art (Archaeological Sites) is in the Project APE ▪ No NHTs or potential NHTs, NHLs, or TCPs were identified ▪ High potential for encountering numerous unrecorded archaeological sites (e.g., rock art, granaries, ceremonial sites, and habitations) and historic coal mining sites along Argyle Canyon and the vicinity of Nine Mile Canyon	Same as COUT-C
Environmental consequences	0.0 mile of high, moderate, and low cultural resource intensity	Same as COUT-C
Selective mitigation	Specific mitigation measures for historic properties, if encountered, would be developed by the BLM in consultation with the consulting parties to the Programmatic Agreement, American Indian tribes, and the Project Applicant and implemented to mitigate any identified adverse impacts. These may include, but are not limited to, Project modifications and data recovery studies	Same as COUT-C
Cumulative effects	The addition of the Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources	Same as COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	No

Camp Timberlane/Argyle Canyon

F.6 Camp Timberlane/Argyle Canyon

This variation area is located 10 miles north of Helper, Utah and directly north of Emma Park between Argyle Canyon and Soldier Summit (Map F-6).

Early in 2014, the Church of Jesus Christ of Latter Day Saints (the LDS Church) contacted the BLM, USFS, and Applicant to inform them that the alignment of the route of Alternative COUT-C (the Agency Preferred Alternative) as described in the Draft EIS crosses an area of privately owned parcels operated by the LDS Church as a youth camp, Camp Timberlane (Link U437, U511). In subsequent meetings, representatives of the LDS Church realty division requested a route variation be developed that avoids crossing through the camp.

South and west of Camp Timberlane is a subdivision developed with seasonal residences. (Affected links include primarily U520, U434, U439, U512, and U443.) Many of the landowners in the subdivision organized and protested the location of the alternative routing, and attended the public open house meeting for the Draft EIS in Price, Utah. In August, the landowners requested a field trip with the Applicant to review a potential routing variation for the proposed transmission line that would be acceptable to the landowners.

Considering routing to avoid Camp Timberlane and considering the routing identified with the Argyle Canyon landowners, the Applicant developed several route variations along the path of the Agency Preferred Alternative route for environmental review. A series of route options were developed and through review of these route options, six refined route variations were established to traverse this area to balance resource impacts. Once the route variations were developed, the BLM analyzed the effects of and compared the alternative route variations. The alignment that emerged from the analysis with the least impact was, starting from the east, Links U408, U411, U417, U445, U504, U508, U514, U516, and U560; which is responsive to both the LDS Church and the Argyle Canyon landowners concerns.

The lands crossed by the route of Alternative COUT-C (the Agency Preferred Alternative) and the route variations are mostly privately owned with areas of BLM-, USFS-, and state-administered lands. Primary resource issues in this area include: Camp Timberlane and Crescent Regional Camp, dispersed residences and summer cabins, greater sage-grouse leks in Emma Park, special status plant potential habitat, IRA roadless and wilderness characteristics, and the Reservation Ridge Scenic Backway.

Table F-45 is a comparison of substantive resource issues for each route variation. Table F-46 is a comparison of miles of each jurisdiction crossed by the route variations, and Table F-47 is a summary of estimated ground disturbance and vegetation clearing for the route variations. Tables F-48 to F-55 describe the inventory, impacts, and plan compliance for each resource in a side-by-side comparison of route variations. The length and links of each routing options are as follows:

Route/Route Variation	Links	Length (miles)
Alternative COUT-C	U408, U411, U417, U445, U504, U508, U514, U516, U560	35.3
Variation 1	U408, U411, U415, U417, U441, U443, U502, U508, U514, U516, U560	34.4
Variation 2	U408, U411, U417, U415, U441, U439, U512, U514, U540, U515, U560	34.7
Variation 3	U409, U414, U417, U445, U504, U508, U514, U516, U560	35.3
Variation 4	U409, U419, U437,U511, U520, U514, U516, U560	34.6
Variation 5	U409, U419, U437, U511, U513, U515, U560	33.5

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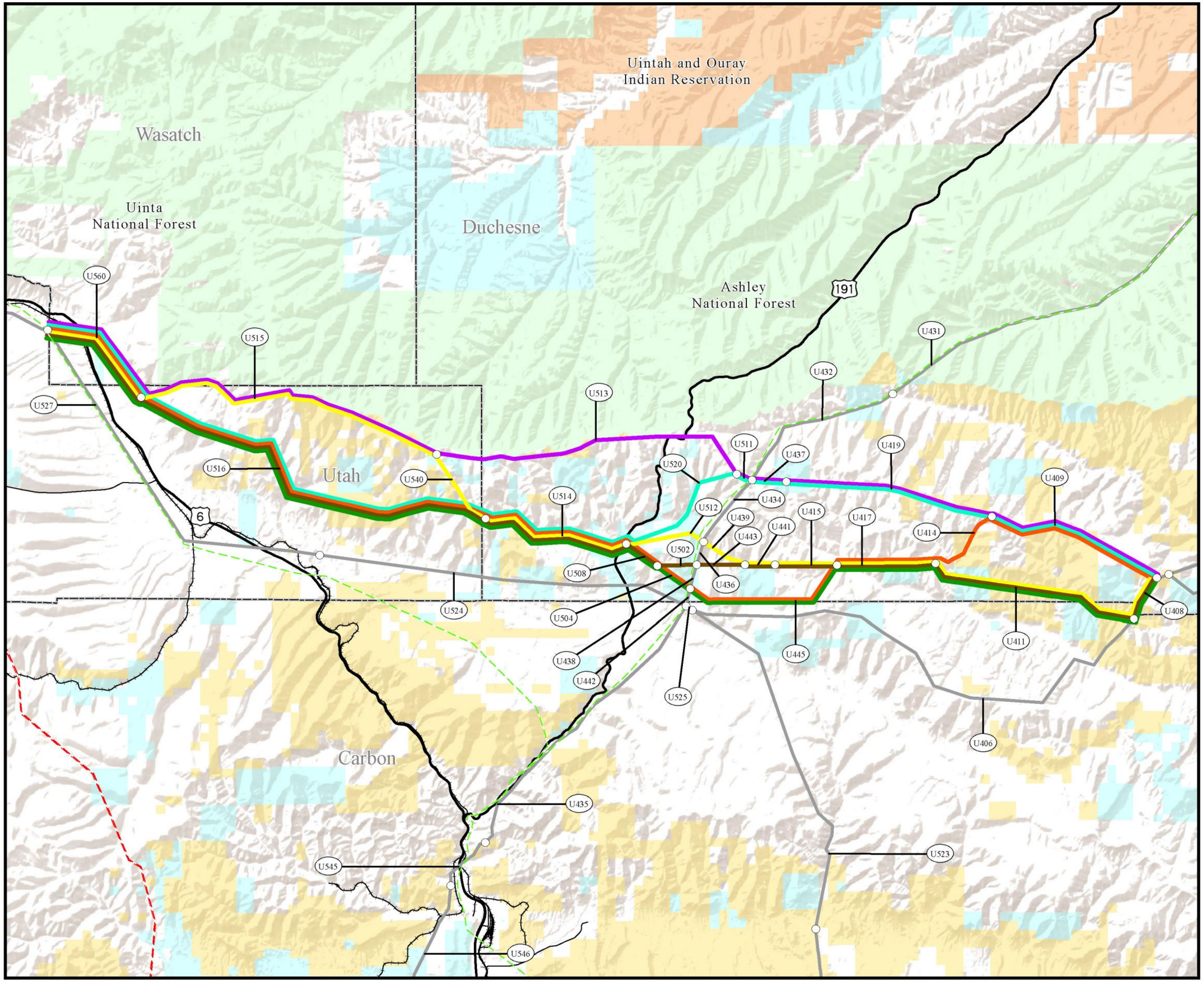

Map F-6

Camp Timberlane/ Argyle Canyon

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Project Features

🟩 Alternative COUT-C	Variation 5
Variation 1	All Other Alternative Routes
Variation 2	Link Number
Variation 3	○ Link Node
Variation 4	

Land Ownership

Bureau of Land Management	State Land
Indian Reservation	Private Land
U.S. Forest Service	

General Reference

345kV Transmission Line	U.S. Highway
138kV Transmission Line	State Highway
Railroad	Other Road
	County Boundary

SOURCES:
Land Jurisdiction, BLM 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads, and Railroads, ESRI 2013; County Boundary, ESRI 2013;
U.S. Forest Service Boundary, USFS 2006

NOTES:
- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.
- Alternative routes are graphically depicted on map and, in most cases, share centerline alignment in common areas.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

0 1 2 4
Miles

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TABLE F-45
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Climate and Air Quality	Due to the regional-scale of climate and air quality data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.1 for this alternative route.	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Earth Resources (miles crossed) (for detailed information, refer to Table F-48)	▪ 0.1 mile of Prime Farmland ▪ 2.7 miles of moderate susceptibility to water erosion ▪ 1.4 miles of moderate susceptibility to wind erosion. ▪ 22.4 miles of moderate landslide susceptibility. ▪ 9.7 miles of oil and gas leases	▪ 0.1 mile of Prime Farmland. ▪ 2.2 miles of moderate susceptibility to water erosion and 1.4 miles of moderate susceptibility to wind erosion ▪ 22.6 miles of moderate landslide susceptibility ▪ 9.6 miles of oil and gas leases	▪ 0.1 mile of Prime Farmland ▪ 2.0 miles of moderate susceptibility to water erosion ▪ 2.0 miles of moderate susceptibility to wind erosion ▪ 23.8 miles of moderate landslide susceptibility. ▪ 11.5 miles of oil and gas lease	▪ 2.1 miles of moderate susceptibility to water erosion ▪ 0.7 mile of moderate susceptibility to wind erosion. ▪ 20.3 miles of moderate landslide susceptibility ▪ 7.7 miles of oil and gas leases	▪ 1.6 miles of moderate susceptibility to water erosion ▪ 0.7 mile of moderate susceptibility to wind erosion ▪ 18.8 miles of moderate landslide susceptibility ▪ 6.4 miles of oil and gas leases ▪ 0.2 mile with active mines or producing wells	▪ 1.5 miles of moderate susceptibility to water erosion ▪ 1.3 miles of moderate susceptibility to wind erosion ▪ 15.9 miles of moderate landslide susceptibility ▪ 7.0 miles of oil and gas leases ▪ 0.2 mile with active mines or producing wells
Paleontological Resources (for detailed information, refer to Table F-49)	Almost entire route crosses area in PFYC of 4	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Water Resources (for detailed information, refer to Table F-50)	No critical impacts	No critical impacts	No critical impacts	No critical impacts	No critical impacts	No critical impacts
Biological Resources						
Vegetation (for detailed information, refer to Table F-51)	No critical impacts	No critical impacts	No critical impacts	No critical impacts	No critical impacts	No critical impacts
Special Status Plants (for detailed information, refer to Table F-51)	None	None	None	Crosses Grahams and White River penstemon potential habitat	Crosses Grahams and White River penstemon potential habitat	Crosses Grahams and White River penstemon potential habitat
Wildlife (for detailed information, refer to Table F-51)	No critical impacts	No critical impacts	No critical impacts	No critical impacts	No critical impacts	No critical impacts
Special Status Wildlife (for detailed information, refer to Table F-51)	1.3 miles of high impacts on greater sage-grouse priority habitat (in an area heavily affected by existing infrastructure) and 4.1 miles of moderate impacts on Mexican spotted owl potential habitat This route is located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically separated (but potentially visible) from sage-grouse habitats.	1.3 miles of high impacts on greater sage-grouse priority habitat (in an area heavily affected by existing infrastructure) and 5.5 miles of moderate impacts on Mexican spotted owl potential habitat This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically separated (but potentially visible) from sage-grouse habitats.	1.3 miles of high impacts on greater sage-grouse priority habitat (in an area heavily affected by existing infrastructure) and 5.3 miles of moderate impacts on Mexican spotted owl potential habitat This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically separated (but potentially visible) from sage-grouse habitats.	1.3 miles of high impacts on greater sage-grouse priority habitat (in an area heavily affected by existing infrastructure) and 1.8 miles of moderate impacts on Mexican spotted owl potential habitat This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically separated (but potentially visible) from sage-grouse habitats.	1.3 miles of high impacts on greater sage-grouse priority habitat (in an area heavily affected by existing infrastructure) and 4.1 miles of moderate impacts on Mexican spotted owl potential habitat This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically separated (but potentially visible) from sage-grouse habitats.	1.3 miles of high impacts on greater sage-grouse priority habitat (in an area heavily affected by existing infrastructure) and 1.3 miles of moderate impacts on Mexican spotted owl potential habitat This route would avoid all areas within 4 miles of sage-grouse leks in the Emma Park area.

TABLE F-45
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Migratory Birds (for detailed information, refer to Table F-51)	Due to the regional-scale of migratory bird data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.9 for this alternative route.	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C
Fish and Aquatics (for detailed information, refer to Table F-51)	None	None	None	None	None	None
Land Use						
Land Use (miles crossed) (for detailed information, refer to Table F-52)	0.1 mile of moderate impacts from crossing residential properties	0.1 mile of moderate impacts from crossing residential properties	0.2 mile of moderate impacts from crossing residential properties	0.1 mile of moderate impacts from crossing residential properties	0.2 mile of moderate impacts from crossing residential properties	0.6 mile of moderate impacts from crossing residential properties
Parks, Preservation, and Recreation areas (miles crossed) (for detailed information, refer to Table F-53)	▪ 1.1 miles of semi-primitive non-motorized recreation opportunity spectrum ▪ 0.2 mile of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway	▪ 1.1 miles of semi-primitive non-motorized recreation opportunity spectrum ▪ 0.2 mile of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway	▪ 0.6 mile of the Church of Jesus Christ of Latter-Day Saints Crescent Regional Recreational Camp ▪ 1.1 miles of semi-primitive non-motorized recreation opportunity spectrum ▪ 1.8 miles of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway and Reservation Ridge Scenic Backway	▪ 0.2 mile of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway	▪ 1.0 mile of the Church of Jesus Christ of Latter-Day Saints Camp Timberlane Recreational Camp ▪ 0.2 mile of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway	▪ 1.6 mile of the Church of Jesus Christ of Latter-Day Saints Camp Timberlane Recreational Camp ▪ 4.2 miles of the Dinosaur Diamond Prehistoric Byway and Indian Canyon Scenic Byway and Reservation Ridge Scenic Backway
Transportation and Access (for detailed information, refer to Table F-53)	None	None	None	None	None	None
Congressional Designations (for detailed information, refer to Table F-53)	None	None	None	None	None	None
Special Designations and Other Management Areas (for detailed information, refer to Table F-53)	None	None	None	None	None	None
Lands with Wilderness Characteristics (for detailed information, refer to Table F-53)	None	None	None	None	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas (for detailed information, refer to Table F-53)	None	None	Low impacts on Soldier Creek Inventoried Roadless Area (IRA)	None	None	Moderate impacts on IRA 0401012 and low impacts on Soldier Creek IRA

TABLE F-45
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Visual Resources (for detailed information, refer to Table F-54)	▪ High impact on Class B scenery ▪ High impact on views from residences (Minnie Maud Creek, U.S. Highway 191, Willow Creek, and Soldier Summit), Dinosaur Diamond/Indian Canyon Scenic Byways (U.S. Highway 191), and Crescent Regional Recreation Camp	▪ Similar impact on scenery as COUT-C ▪ Similar impacts on views as COUT-C except for high impact on views from residences on Minnie Maud Ridge	▪ Similar impacts on scenery as COUT-C ▪ Similar impacts on views as COUT-C except for high impact on views from the Reservation Ridge Scenic Backway and longer duration views from the Crescent Regional Recreation Camp ▪ One plan amendment (ANF2)	▪ Decreased impacts on scenery compared to COUT-C ▪ Similar impacts on views as COUT-C	▪ Similar impacts on scenery as COUT-C ▪ High impact on views from residences (Argyle Ridge, U.S. Highway 191, Willow Creek, and Soldier Summit), Dinosaur Diamond/Indian Canyon Scenic Byways (U.S. Highway 191), Camp Timberlane, and Crescent Regional Recreation Camp	▪ Greater impacts on scenery as compared to COUT-C ▪ High impact on views from residences (Argyle Ridge, Argyle Canyon, Reservation Ridge, and Soldier Summit), Dinosaur Diamond/Indian Canyon Scenic Byways (U.S. Highway 191), Reservation Ridge Scenic Backway, Argyle Canyon Road, Avintaquin Campground, Camp Timberlane, and Crescent Regional Recreation Camp ▪ Three plan amendments (ANF1, ANF2, and VFO5)
Cultural Resources (for detailed information, refer to Table F-55)	▪ 39 sites identified by the Class I inventory; no known sites in the Project APE ▪ 0.0 mile of high cultural resource intensity ▪ Unrecorded segments of the U.S. Highway 6 and a standard gauge railroad are crossed by Link U560. The railroad, formerly part of the Utah and Pleasant Valley Railway ([U&PV]1879-1882), the Denver and Rio Grande Western Railway (1882-1889), and the Rio Grande Western Railway (1890), is currently owned by the Union Pacific (Central Corridor) ▪ Key resources include Argyle Canyon Rock Art (Archaeological Sites), Soldier Summit, U.S. Highway 6, the Emma Park Road, and the historic standard gauge railroad owned by the Union Pacific; of these resources, only unrecorded segments of the U.S. Highway 6 and the railroad are in the Project APE ▪ High potential for encountering numerous unrecorded archaeological sites (primarily rock art) and historic coal mining sites along Minnie Maud Creek and the vicinity of Argyle Canyon	▪ Same as COUT-C	▪ 21 sites identified by the Class I inventory; no known sites in the Project APE ▪ 0.0 mile of high cultural resource intensity ▪ Same unrecorded historic linear sites are crossed ▪ Same key resources as COUT-C with the exception of the Emma Park Road ▪ Same potential for encountering unrecorded cultural resources	▪ Same as COUT-C	▪ 37 sites identified by the Class I inventory; no known sites in the Project APE ▪ 0.0 mile of high cultural resource intensity ▪ Same unrecorded historic linear sites are crossed ▪ Same key resources as Variation 2 ▪ Same potential for encountering unrecorded cultural resources	▪ 37 sites identified by the Class I inventory; no known sites in the Project APE ▪ 0.0 mile of high cultural resource intensity ▪ Same unrecorded historic linear sites are crossed ▪ Same key resources as Variation 2 with the exception of Argyle Canyon Rock Art (Archaeological Sites), which is in the Project APE ▪ Same potential for encountering unrecorded cultural resources
Fire Ecology and Management	Due to the regional-scale of fire ecology and management data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.21 for this alternative route.	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C

TABLE F-45 CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS BY RESOURCE						
Resource	**Alternative COUT-C (35.3 miles)**	**Variation 1 (34.4 miles)**	**Variation 2 (34.7 miles)**	**Variation 3 (35.3 miles)**	**Variation 4 (34.6 miles)**	**Variation 5 (33.5 miles)**
Social and Economic Conditions	Effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.22 for this alternative route.	Same as COUT-C	Same as COUT-C, except 23 additional residences are located within a quarter mile and 6 additional residences within a tenth of a mile of Variation 2.	Same as COUT-C	Same as COUT-C, except 27 additional residences are located within a quarter mile and 13 additional residences within a tenth of a mile of Variation 4.	Same as COUT-C, except 32 additional residences are located within a quarter mile and 17 additional residences within a tenth of a mile of Variation 5.
Public Health (EMF)	Due to the scale of public health data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.23 for this alternative route.	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C

TABLE F-46 CAMP TIMBERLANE/ARGYLE CANYON – 500-KILOVOLT TRANSMISSION LINE PARALLEL CONDITIONS AND JURISDICTION BY ROUTE VARIATION						
Focus of Comparison	**Alternative COUT-C (35.3 miles)**	**Variation 1 (34.4 miles)**	**Variation 2 (34.7 miles)**	**Variation 3 (35.3 miles)**	**Variation 4 (34.6 miles)**	**Variation 5 (33.5 miles)**
Jurisdiction (miles crossed)						
BLM	6.8	6.8	7.5	5.2	5.8	9.3
USFS	0.0	0.0	1.4	0.0	0.0	1.8
NPS	0.0	0.0	0.0	0.0	0.0	0.0
State	5.3	3.6	4.0	3.9	4.2	1.4
Tribal	0.0	0.0	0.0	0.0	0.0	0.0
Private	23.2	24.0	21.8	26.2	24.6	21.0

TABLE F-47 CAMP TIMBERLANE/ARGYLE CANYON – SUMMARY OF ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING FOR THE 500-KILOVOLT TRANSMISSION LINE AND SERIES COMPENSATION STATIONS						
Focus of Comparison	**Alternative COUT-C (35.3 miles)**	**Variation 1 (34.4 miles)**	**Variation 2 (34.7 miles)**	**Variation 3 (35.3 miles)**	**Variation 4 (34.6 miles)**	**Variation 5 (33.5 miles)**
Temporary disturbance (acres)[1, 4]	369	360	363	369	362	352
Permanent disturbance (acres)[2, 4]	392	379	413	326	263	294
Total disturbance (acres)	761	739	776	695	625	645
Transmission-line right-of-way vegetation clearing (acres)[3, 4]	566	550	535	573	671	560
Access Roads						
Existing (miles)[5]	14.2	14.1	14.1	19.8	27.0	24.6
New (miles)[6]	21.1	20.3	20.6	15.5	7.6	8.9

SOURCE: Assumptions for the calculations are derived from the Applicant's description of the Project (Appendix B).

NOTES:

[1] Temporary disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure), wire tensioning/pulling sites (250 by 400 feet; two every 3-5 miles), wire splicing sites (100 by 100 feet every 9,000 feet), multi-purpose construction yards (30-acre site located approximately every 20 miles), helicopter fly yards (15-acre site; located approximately every 5 miles), guard structures (150 by 75 feet; approximately 1.4 structures per 1 mile), and temporary access roads (refer to Table 2-1).

[2] Permanent disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (60 by 60 feet per structure), communication regeneration stations (100 by 100 feet, one station approximately every 55 miles), series compensation stations, and permanent access roads (refer to Tables 2-1 and 2-2).

[3] Right-of-way vegetation clearing: vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, mountain forest, mountain shrub, pinyon-juniper, and riparian), and overlap with other disturbance in the Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes and route variations at this time and is required to accurately identify locations of temporary and permanent access roads. Temporary and permanent disturbance calculations include estimated disturbance for all access roads.

[4] Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, columns may not sum exactly.

[5] Miles of the reference centerline that are anticipated to use existing and/or improved existing access roads.

[6] Miles of the reference centerline that are anticipated to use newly constructed and/or overland access.

TABLE F-48
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Geologic Hazards						
Affected environment (miles crossed)	▪ No mine subsidence ▪ Low susceptibility to flood hazard ▪ 22.4 miles of moderate susceptibility for landslides	▪ No mine subsidence ▪ Low susceptibility to flood hazard ▪ 11.8 miles of moderate susceptibility for landslides	▪ No mine subsidence ▪ Low susceptibility to flood hazard ▪ 10.9 miles of moderate susceptibility for landslides	▪ No mine subsidence ▪ Low susceptibility to flood hazard ▪ 15 miles of moderate susceptibility for landslides	▪ No mine subsidence ▪ Low susceptibility to flood hazard ▪ 15.8 miles of moderate susceptibility for landslides	▪ No mine subsidence ▪ Low susceptibility to flood hazard ▪ 17.6 miles of moderate susceptibility for landslides
Environmental consequences	Moderate susceptibility for landslides	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Selective mitigation	3	3	3	3	3	3
Cumulative effects	Could have incremental impacts on areas prone to landslides	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Soil Resources						
Affected Environment (miles crossed)	▪ 2.7 miles of moderate susceptibility to water erosion ▪ 1.4 miles of moderate susceptibility to wind erosion ▪ 0.1 mile of Prime or Unique Farmland	▪ 2.2 miles of moderate susceptibility to water erosion ▪ 1.4 miles of moderate susceptibility to wind erosion ▪ 0.1 mile of Prime or Unique Farmland	▪ 1.6 miles of high and 2.0 miles of moderate susceptibility to water erosion ▪ 2.0 miles of moderate susceptibility to wind erosion ▪ 0.1 mile of Prime or Unique Farmland	▪ 2.1 miles of moderate susceptibility to water erosion ▪ 0.7 mile of moderate susceptibility to wind erosion ▪ No Prime or Unique Farmland	▪ 1.6 miles of moderate susceptibility to water erosion ▪ 0.7 mile of moderate susceptibility to wind erosion ▪ No Prime or Unique Farmland	▪ 1.8 miles of high and 1.5 miles of moderate susceptibility to water erosion ▪ 1.3 miles of moderate wind erosion ▪ No Prime or Unique Farmland

TABLE F-48
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES

Focus of Comparison	**Alternative COUT-C (35.3 miles)**	**Variation 1 (34.4 miles)**	**Variation 2 (34.7 miles)**	**Variation 3 (35.3 miles)**	**Variation 4 (34.6 miles)**	**Variation 5 (33.5 miles)**
Environmental consequences	Moderate impact to soils with wind and water erosion	Same as COUT-C	Most impacts on soils for wind and water erosion	Same as COUT-C	Lowest impacts on soils	Highest impacts on soils with high susceptibility to water erosion
Selective mitigation	2 and 7	2 and 7	2 and 7	2 and 7	2 and 7	2 and 7
Cumulative effects	Could have incremental impacts on soils with moderate susceptibility to wind and water erosion	Same as COUT-C	Could have incremental impacts on soils with moderate and high susceptibility to wind and water erosion	Same as COUT-C	Same as COUT-C	Could have incremental impacts on soils with moderate and high susceptibility to wind and water erosion
Mineral Resources						
Affected environment (miles crossed)	▪ Crosses no active mines or producing wells ▪ 9.7 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases	▪ Crosses no active mines or producing wells ▪ 9.6 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases	▪ Crosses no active mines or producing wells ▪ 11.5 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases	▪ Crosses no active mines or producing wells ▪ 7.7 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases	▪ 0.2 mile of active mines or producing wells ▪ 6.4 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases	▪ 0.2 mile of active mines or producing wells ▪ 7.0 miles of permitted mines, coal leases, oil and gas leases, or geothermal leases
Environmental consequences	Crosses the second greatest mileage of leases	Crosses the third greatest mileage of leases	Crosses the greatest mileage of leases	Crosses the fourth greatest mileage of leases	Crosses the least amount leases; crosses small area with producing wells	Crosses the fifth greatest mileage of leases; cross small area with producing wells
Selective mitigation	None	None	None	None	2 and 7	2 and 7
Cumulative effects	Could have incremental impacts on leases	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C

TABLE F-48
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Plan Compliance						
Plan amendment (Yes or No)	No	No	No	No	No	No

TABLE F-49
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Affected Environment						
PFYC formations	PFYC 2 and 4	PFYC 2 and 4	PFYC 2 and 4	PFYC 2 and 4	PFYC 2 and 4	PFYC 2 and 4
Known locality density within 1.0 mile of the centerline	Low	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Environmental Consequences						
PFYC formations (miles crossed)	34.1 miles of PFYC 4	33.2 miles of PFYC 4	33.5 miles of PFYC 4	34.1 miles of PFYC 4	33.4 miles of PFYC 4	32.3 miles of PFYC 4
Percent of route crossing PFYC 4	97	97	97	97	97%	96
Impacts on paleontological resources anticipated	Could have high impacts on paleontological resources	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Selective mitigation	None	None	None	None	None	None
Cumulative effects	Could have incremental impacts on paleontological resources	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Plan Compliance						
Plan amendment (Yes or No)	No	No	No	No	No	No

TABLE F-50
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
▪ Affected Environment						
Class 1: Outstanding waters	None	None	15 crossings	None	None	15 crossings
Class 4: State-listed impaired waters	None	None	None	None	None	None
Palustrine emergent wetlands	1 crossing	1 crossing	1 crossing	1 crossing	None	None
Palustrine forested overstory wetlands	None	None	None	None	None	None
Palustrine scrub/shrub wetlands	None	None	None	None	None	None
Perennial stream/river	15 crossings	14 crossings	22 crossings	15 crossings	9 crossings	13 crossings
Intermittent stream	24 crossings	26 crossings	32 crossings	22 crossings	18 crossings	20 crossings
Riparian areas	None	None	None	None	None	None
Swamp/marsh/estuary	None	None	None	None	None	None
Well/spring	None	None	None	None	None	None
Environmental Consequence						
Residual impacts (miles crossed)	▪ 1.7 miles of moderate impacts ▪ 7.7 miles of low impacts	▪ 1.5 miles of moderate impacts ▪ 7.2 miles of low impacts	▪ 1.7 miles of moderate impacts ▪ 7.8 miles of low impacts	▪ 1.7 miles of moderate impacts ▪ 7.1 miles of low impacts	▪ 1.0 mile of moderate impacts ▪ 6.4 miles of low impacts	▪ 0.9 mile of moderate impacts ▪ 4.6 miles of low residual impacts
Selective mitigation	1, 2, 7, and 11	1, 2, 7, and 11	1, 2, 7, and 11	1, 2, 7, and 11	1, 2, 7, and 11	1, 2, 7, and 11
Cumulative effects	Vicinity of the proposed TransWest Express transmission line, west of U.S. Highway 191, leading to minor incremental impacts on water resources in the area.	Similar to COUT-C	Similar to COUT-C	Vicinity of the proposed TransWest Express transmission line, except in proximity to U.S. Highway 191, leading to minor incremental impacts on water resources in the area.	Vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on water resources in the area.	Similar to Variation 4

TABLE F-50
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Plan Compliance						
Plan amendment (Yes or No)	No	No	No	No	No	No

TABLE F-51
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Vegetation						
Affected environment (miles of vegetation communities crossed)	▪ 0.1 mil of alpine ▪ 0.8 mile of aspen ▪ 0.8 mile of barren ▪ 16.1 miles of big sagebrush ▪ 0.4 mile of grassland ▪ 3.1 miles of montane forest ▪ 3.2 miles of mountain shrub ▪ 3.5 miles of pinyon-juniper ▪ 0.1 mile of shrub/shrub steppe	▪ 0.1 miles of alpine ▪ 7.2 miles of aspen ▪ 0.9 mile of barren ▪ 15.6 miles of big sagebrush ▪ 0.4 mile of grassland ▪ 3.6 miles of montane forest ▪ 3.4 miles of mountain shrub ▪ 3.1 miles of pinyon-juniper ▪ 0.1 mile of shrub/shrub steppe	▪ 5.1 miles of aspen ▪ 0.8 mile of barren ▪ 16.4 miles of big sagebrush ▪ 0.6 mile of grassland ▪ 4.8 miles of montane forest ▪ 3.9 miles of mountain shrub ▪ 3.0 miles of pinyon-juniper ▪ 0.1 mile of shrub/shrub steppe	▪ 0.1 mile of alpine ▪ 9.6 miles of aspen ▪ 0.5 mile of barren ▪ 16.0 miles of big sagebrush ▪ 0.6 mile of grassland ▪ 3.5 miles of montane forest ▪ 2.7 miles of mountain shrub ▪ 2.2 miles of pinyon-juniper ▪ 0.1 mile of shrub/shrub steppe	▪ 0.1 mile of alpine ▪ 10.5 miles of aspen ▪ 12.8 miles of big sagebrush ▪ 0.5 mile of grassland ▪ 6.9 miles of montane forest ▪ 2.4 miles of mountain shrub ▪ 1.3 miles of pinyon-juniper ▪ 0.1 mile shrub/shrub steppe	▪ 5.8 miles of aspen ▪ 15.2 miles of big sagebrush ▪ 0.7 mile of grassland ▪ 8.5 miles of montane forest ▪ 2.4 miles of mountain shrub ▪ 0.9 mile of pinyon-juniper
Environmental consequences (miles crossed)	▪ 31.7 miles of moderate impacts ▪ 3.6 miles of low-moderate impacts	▪ 31.2 miles of moderate impacts ▪ 3.2 miles of low-moderate impacts	▪ 31.6 miles of moderate impacts ▪ 3.1 miles of low-moderate impacts	▪ 33.0 miles of moderate impacts ▪ 2.3 miles of low-moderate impacts	▪ 33.2 miles of moderate impacts ▪ 1.4 miles of low-moderate impacts	▪ 32.6 miles of moderate impacts ▪ 0.9 mile of low-moderate impacts
Selective mitigation	1, 2, 4, and 7	1, 2, 4, and 7	1, 2, 4, and 7	1, 2, 4, and 7	1, 2, 4, and 7	1, 2, 4, and 7
Cumulative effects	Project would be located in the vicinity of the proposed TransWest Express transmission project, west of U.S.	Similar to COUT-C	Similar to COUT-C	The Project would be located in the vicinity of the proposed TransWest Express Transmission Project,	The Project would be located in the vicinity of the proposed TransWest Express Transmission Project	Similar to Variation 4

TABLE F-51
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
	Highway 191, leading to minor incremental impacts on vegetation in the area.			except in proximity to U.S. Highway 191, leading to minor incremental impacts on vegetation in the area.	leading to minor incremental impacts on vegetation in the area.	
Special Status Plants						
Affected environment (miles crossed)	No identifiable special status plant habitat crossed	No identifiable special status plant habitat crossed	No identifiable special status plant habitat crossed	4.8 miles of Grahams penstemon potential habitat 4.8 miles of White River penstemon potential habitat	9.5 miles of Grahams penstemon potential habitat 9.5 miles of White River penstemon potential habitat	10.6 miles of Grahams penstemon potential habitat 10.6 miles of White River penstemon potential habitat
Environmental consequences (miles crossed)	None	None	None	4.8 miles of low impacts	9.5 miles of low impacts	10.6 miles of low impacts
Selective mitigation	None	None	None	2 and 7	2 and 7	2 and 7
Cumulative effects	None	None	None	Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on special status plants in the area	Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on special status plants in the area	Similar to Variation 4
Wildlife						
Affected environment (miles crossed)	▪ 15.9 miles of elk crucial winter range ▪ 1.5 miles of elk crucial year-long range ▪ 33.1 miles of moose crucial winter range ▪ 2.2 miles of moose crucial year-long range	▪ 14.7 miles of elk crucial winter range ▪ 1.5 miles of elk crucial year-long range ▪ 32.2 miles of moose crucial winter range ▪ 2.2 miles of moose crucial year-long	▪ Elk crucial summer range – 2.2 ▪ Elk crucial winter range – 11.8 ▪ Elk crucial year-long range – 1.5 ▪ Moose crucial winter range – 31.9	▪ 14.1 miles of elk crucial winter range ▪ 1.5 miles of elk crucial year-long range ▪ 33.1 miles of moose crucial winter range ▪ 2.2 miles of moose crucial year-long	▪ 9.8 miles of elk crucial winter range ▪ 1.5 miles of elk crucial year-long range ▪ 32.4 miles of moose crucial winter range ▪ 2.2 miles of moose crucial year-long	▪ 2.9 miles of elk crucial summer range ▪ 3.8 miles of elk crucial winter range ▪ 1.5 miles of elk crucial year-long range

TABLE F-51
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
	▪ 2.2 miles of moose calving grounds ▪ 31.8 miles of mule deer crucial summer range ▪ 0.2 mile of mule deer crucial winter range	range ▪ 2.2 miles of moose calving grounds ▪ 30.9 miles of mule deer crucial summer range ▪ 0.2 mile of mule deer crucial winter range	▪ Moose crucial yearlong range – 0.6 ▪ Moose calving grounds – 0.6 ▪ Mule deer crucial summer range – 31.2 ▪ Mule deer crucial winter range – 0.2	range ▪ 2.2 miles of moose calving grounds ▪ 34.0 miles of mule deer crucial summer range ▪ 1.3 miles of mule deer crucial winter range	range ▪ 2.2 miles of moose calving grounds ▪ 33.3 miles of mule deer crucial summer range ▪ 1.3 miles of mule deer crucial winter range	▪ 30.0 miles of moose crucial winter range ▪ 0.6 mile of moose crucial year-long range ▪ 0.6 mile of moose calving grounds ▪ 32.2 miles of mule deer crucial summer range ▪ 1.3 miles of mule deer crucial winter range
Environmental consequences (miles crossed)	▪ 35.3 miles of low impacts	▪ 34.4 miles of low impacts	▪ 34.7 miles of low impacts	▪ 35.3 miles of low impacts	▪ 34.6 miles of low impacts	▪ 33.5 miles of low impacts
Selective mitigation	▪ 12 and 15	▪ 12 and 15	▪ 12 and 15	▪ 12 and 15	▪ 12 and 15	▪ 12 and 15
Cumulative effects	▪ Project would be located in the vicinity of the proposed TransWest Express transmission line, west of U.S. Highway 191, leading to minor incremental impacts on wildlife in the area.	▪ Similar to COUT-C	▪ Similar to COUT-C	▪ Project would be located in the vicinity of the proposed TransWest Express transmission line, except in proximity to U.S. Highway 191, leading to minor incremental impacts on wildlife in the area.	▪ Project would be located in the vicinity of the proposed TransWest Express transmission line leading to minor incremental impacts on wildlife in the area.	▪ Similar to Variation 4
Special Status Wildlife						
Affected environment (miles crossed)	▪ 4.1 miles of Mexican spotted owl potential habitat ▪ 1.3 miles of greater	▪ 5.5 miles of Mexican spotted owl potential habitat ▪ 1.3 miles of greater	▪ 5.3 miles of Mexican spotted owl potential habitat ▪ 1.3 miles of greater	▪ 1.8 miles of Mexican spotted owl potential habitat ▪ 1.3 miles of greater	▪ 2.9 miles of Mexican spotted owl potential habitat ▪ 1.3 miles of greater	▪ 1.3 miles of Mexican spotted owl potential habitat

TABLE F-51 CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES						
Focus of Comparison	**Alternative COUT-C (35.3 miles)**	**Variation 1 (34.4 miles)**	**Variation 2 (34.7 miles)**	**Variation 3 (35.3 miles)**	**Variation 4 (34.6 miles)**	**Variation 5 (33.5 miles)**
	sage-grouse priority habitat area (this area contains high densities of existing infrastructure (i.e., highways, railroads, powerlines, and residential development.) ▪ Note: Residents in Argyle Canyon area report observations of sage-grouse outside of mapped habitat in forested areas. These areas are not typical sage-grouse habitat, there have been no confirmed sage-grouse in this area, and this area contains Utah Division of Wildlife Resources (UDWR) designated blue grouse habitat ▪ This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route largely would be in a sparsely wooded area, topographically separated (but potentially visible)	sage-grouse priority habitat area (this area contains high densities of existing infrastructure (i.e., highways, railroads, powerlines, and residential development.) ▪ Note: Residents in Argyle Canyon area report observations of sage-grouse outside of mapped habitat in forested areas. These areas are not typical sage-grouse habitat, there have been no confirmed sage-grouse in this area, and this area contains UDWR designated blue grouse habitat ▪ This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically	sage-grouse priority habitat area (this area contains high densities of existing infrastructure (i.e., highways, railroads, powerlines, and residential development.) ▪ Note: Residents in Argyle Canyon area report observations of sage-grouse outside of mapped habitat in forested areas. These areas are not typical sage-grouse habitat, there have been no confirmed sage-grouse in this area, and this area contains UDWR designated blue grouse habitat ▪ This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically separated (but potentially visible) from sage-grouse habitats.	sage-grouse priority habitat area (this area contains high densities of existing infrastructure (i.e., highways, railroads, powerlines, and residential development.) ▪ Note: Residents in Argyle Canyon area report observations of sage-grouse outside of mapped habitat in forested areas. These areas are not typical sage-grouse habitat, there have been no confirmed sage-grouse in this area, and this area contains UDWR designated blue grouse habitat ▪ This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically	sage-grouse priority habitat area (this area contains high densities of existing infrastructure (i.e., highways, railroads, powerlines, and residential development.) ▪ Note: Residents in Argyle Canyon area report observations of sage-grouse outside of mapped habitat in forested areas. These areas are not typical sage-grouse habitat, there have been no confirmed sage-grouse in this area, and this area contains UDWR designated blue grouse habitat ▪ This route would be located within 4 miles of sage-grouse leks in the Emma Park area, but outside of designated habitats. The route would largely be in a sparsely wooded area, topographically separated (but potentially visible) from sage-grouse habitats.	▪ 4.1 miles of Mexican spotted owl potential habitat ▪ 1.3 miles of greater sage-grouse priority habitat area (this area contains high densities of existing infrastructure (i.e., highways, railroads, powerlines, and residential development.) ▪ Note: Residents in Argyle Canyon area report observations of sage-grouse outside of mapped habitat in forested areas. These areas are not typical sage-grouse habitat, there have been no confirmed sage-grouse in this area, and this area contains UDWR designated blue grouse habitat ▪ This route would avoid all areas within 4 miles of sage-grouse leks in the Emma Park

TABLE F-51
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	**Alternative COUT-C (35.3 miles)**	**Variation 1 (34.4 miles)**	**Variation 2 (34.7 miles)**	**Variation 3 (35.3 miles)**	**Variation 4 (34.6 miles)**	**Variation 5 (33.5 miles)**
	from sage-grouse habitats.	separated (but potentially visible) from sage-grouse habitats.		separated (but potentially visible) from sage-grouse habitats.		area.
Environmental consequences (miles crossed)	▪ 1.3 miles of high impacts ▪ 4.1 miles of moderate impacts	▪ 1.3 miles of high impacts ▪ 5.5 miles of moderate impacts	▪ 1.3 miles of high impacts ▪ 5.3 miles of moderate impacts	▪ 1.3 miles of high impacts ▪ 1.8 miles of moderate impacts	▪ 1.3 miles of high impacts ▪ 2.9 miles of moderate impacts	▪ 1.3 miles of high impacts ▪ 1.3 miles of moderate impacts
Selective mitigation	2, 4, 5, 7, 12, 13, and 15	2, 4, 5, 7, 12, 13, and 15	2, 4, 5, 7, 12, 13, and 15	2, 4, 5, 7, 12, 13, and 15	2, 4, 5, 7, 12, 13, and 15	2, 4, 5, 7, 12, 13, and 15
Cumulative effects	In locations where the Project would be located in the vicinity of the proposed TransWest Express transmission line, minor incremental impacts on special status wildlife would occur, whereas areas not collocated with the TransWest Express transmission line would have similar impacts on those described for the Project.	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C
Fish and Aquatics						
Affected environment	No specific resources analyzed in detail in the EIS were identified in this area.	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Environmental consequences	None	None	None	None	None	None
Selective mitigation	None	None	None	None	None	None
Cumulative effects	None	None	None	None	None	None

TABLE F-51
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Plan Compliance						
Plan amendment (Yes or No)	No	No	No	No	No	No

TABLE F-52
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR LAND USE

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Utility Corridors (miles)						
Designated (BLM and USFS)	0.0	0.0	0.0	0.0	0.0	0.0
West-wide Energy Corridor	0.0	0.0	0.0	0.0	0.0	0.0
Parallel Linear Facilities (miles)						
500kV	0.0	0.0	0.0	0.0	0.0	0.0
345kV	0.0	0.0	0.0	0.0	0.0	0.0
138kV	1.3	1.2	1.3	1.3	1.3	1.3
230kV	0.0	0.0	0.0	0.0	0.0	0.0
Pipeline	0.0	0.0	0.0	0.0	0.0	0.0
Plan Compliance						
Plan amendment (Yes or No)	Yes, PFO5	Yes, PFO5	Yes, SLFO1 and PFO5	No	No	Yes, SLFO1

NOTES: [1]Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city or county. The generalized permitting is for disclosure and comparison only.

TABLE F-53
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Parks, Preservation, and Recreation areas						
Affected environment and consequences (miles crossed)	▪ 1.1 miles of semi-primitive non-motorized recreation opportunity spectrum ▪ 0.2 mile of the Dinosaur Diamond Prehistoric Scenic Byway/Indian Canyon Scenic Byway.	▪ 1.1 miles of semi-primitive non-motorized recreation opportunity spectrum ▪ 0.2 mile Dinosaur Diamond Prehistoric Scenic Byway/Indian Canyon Scenic Byway and Reservation Ridge Scenic Backway.	▪ 0.6 mile of the Church of Jesus Christ of Latter-Day Saints Crescent Regional Recreational Camp resulting in a moderate impact ▪ 1.1 miles of semi-primitive non-motorized recreation opportunity spectrum ▪ 1.8 miles of Dinosaur Diamond Prehistoric Scenic Byway/Indian Canyon Scenic Byway	▪ 0.2 mile of Dinosaur Diamond Prehistoric Scenic Byway/Indian Canyon Scenic Byway	▪ 1.0 mile of the Church of Jesus Christ of Latter-Day Saints Camp Timberlane Recreational Camp resulting in a moderate impact. ▪ 0.2 mile of Dinosaur Diamond Prehistoric Scenic Byway/Indian Canyon Scenic Byway	▪ 1.6 miles of the Church of Jesus Christ of Latter-Day Saints Camp Timberlane Recreational Camp resulting in a moderate impact ▪ 4.2 miles of the Dinosaur Diamond Prehistoric Scenic Byway/Indian Canyon Scenic Byway and Reservation Ridge Scenic Backway
Selective mitigation	None	None	5 and 7	None	5 and 7	5, 7, and 9
Cumulative effects	The short-term cumulative effects of the Project crossing this Recreation Opportunity Spectrum (ROS) category, in addition to any past and present action and RFFA, would be potentially	The short-term cumulative effects of the Project crossing this ROS category, in addition to any past and present action and RFFA, would be potentially limited access to the ROS area	(See COUT-C and Variation 1 for ROS information) The short-term cumulative effects of the Project crossing the recreational camp, in addition to any past/present and	None	Similar to Variation 2	Similar to Variation 2

TABLE F-53
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS
FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
	limited access to the ROS area and increased noise during construction actions. Long-term effects on the semi-primitive non-motorized ROS area are not anticipated	and increased noise during construction actions. Long-term effects on the semi-primitive non-motorized ROS area are not anticipated	RFFA actions, would potentially limit and/or hinder access to and/or in the recreation camp and increase noise during construction. The long-term cumulative effects would be additional industrial development in recreation camp, which could limit some recreational opportunities			
Transportation and Access						
Affected environment	Crosses U.S. Highways 191 and 6, other roadways, and a railroad.	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Environmental consequences	Moderate impacts would be anticipated where temporary closures and/or delays would occur from construction of the project when crossing roadways (e.g. U.S. Highway 191). See Section 3.2.13 for more information.	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C

TABLE F-53
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Selective mitigation	5 and 9	5 and 9	5 and 9	5 and 9	5 and 9	5 and 9
Cumulative effects	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Congressional Designations						
Affected environment and consequences	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts
Selective mitigation	None	None	None	None	None	None
Cumulative effects	None	None	None	None	None	None
Special Designations and Other Management Areas						
Affected environment and consequences	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts
Selective mitigation	None	None	None	None	None	None
Cumulative effects	None	None	None	None	None	None
Lands with Wilderness Characteristics						
Affected environment and consequences	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts
Selective mitigation	None	None	None	None	None	None
Cumulative effects	None	None	None	None	None	None

TABLE F-53
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; CONGRESSIONAL DESIGNATIONS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Inventoried Roadless Areas and Unroaded/Undeveloped Areas						
Affected environment	None	None	Crosses Soldier Creek IRA for 0.3 mile	None	None	▪ Crosses Soldier Creek IRA for 0.3 mile ▪ Crosses IRA 0401012 for 0.1 mile
Environmental consequences	None	None	Low impacts on Soldier Creek IRA attributes	None	None	▪ Moderate impacts on IRA 0401012 attributes ▪ Low impacts on Soldier Creek IRA attributes
Selective mitigation	None	None	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, and 16	None	None	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, and 16
Cumulative effects	None	None	Colocation with the TransWest Express transmission line would consolidate effects on IRAs.	None	None	Colocation with the TransWest Express transmission line would consolidate effects on IRAs.
Plan Compliance						
Plan amendment (Yes or No)	No	No	No	No	No	No

TABLE F-54
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Affected Environment						
Scenery (miles crossed)	▪ 33.7 miles of Class B ▪ 1.6 miles of Class C	▪ 32.8 miles of Class B ▪ 1.6 miles of Class C	▪ 33.1 miles of Class B ▪ 1.6 miles of Class C	▪ 33.7 miles of Class B ▪ 1.6 miles of Class C	▪ 33.0 miles of Class B ▪ 1.6 miles of Class C	▪ 31.9 miles of Class B ▪ 1.6 miles of Class C
High concern viewers (miles crossed)	▪ 6.1 miles of views within 0.5 mile ▪ V11.2 miles of views between 0.5 mile and 1.0 mile	▪ 7.5 miles of views within 0.5 mile ▪ 12.7 miles of views between 0.5 mile and 1.0 mile	▪ 14.5 miles of views within 0.5 mile ▪ 12.9 miles of views between 0.5 mile and 1.0 mile	▪ 6.1 miles of views within 0.5 mile ▪ 8.0 miles of views between 0.5 mile and 1.0 mile	▪ 7.9 miles of views within 0.5 mile ▪ 10.2 miles of view between 0.5 mile and 1.0 mile	▪ 17.8 miles of views within 0.5 mile ▪ 8.0 miles of views between 0.5 mile and 1.0 mile
Moderate concern viewers (miles crossed)	▪ 1.8 miles of views within 0.5 mile ▪ 1.8 miles of views between 0.5 mile and 1.0 mile	▪ 1.8 miles of views within 0.5 mile ▪ 1.8 miles of views between 0.5 mile and 1.0 mile	▪ 1.8 miles of views within 0.5 mile ▪ 1.7 miles of views between 0.5 mile and 1.0 mile	▪ 1.8 miles of views within 0.5 mile ▪ 1.8 miles of views between 0.5 mile and 1.0 mile	▪ 1.8 miles of views within 0.5 mile ▪ 1.8 miles of views between 0.5 mile and 1.0 mile	▪ 3.2 miles of views within 0.5 mile ▪ 3.0 miles of views between 0.5 mile and 1.0 mile
Federal Agency Visual Management Objectives (miles crossed)	▪ 6.9 miles of BLM VRM Class III	▪ 6.9 miles of BLM VRM Class III	▪ 4.1 miles of BLM VRM Class III ▪ 3.4 miles of BLM VRM Class IV	▪ 5.2 miles of BLM VRM Class III	▪ 5.9 miles of BLM VRM Class III	▪ 5.9 miles of BLM VRM Class III ▪ 3.4 miles of BLM VRM Class IV
Environmental Consequences						
Scenery	High impact on Class B scenery	Similar level of high impact on Class B scenery as COUT-C	Similar level of high impact on Class B scenery as COUT-C	Decreased level of high impact on Class B scenery compared to COUT-C	Similar level of high impact on Class B scenery as COUT-C	Most high impacts on Class B scenery
Residences	High impact on views from residences along Minnie Maud Creek, adjacent to U.S. Highway 191, along Willow Creek, and in Soldier Summit	Similar to COUT-C except for high impact on views from residences on Minnie Maud Ridge	Similar to Variation 1	Similar to COUT-C	High impact on views from residences on Argyle Ridge, adjacent to U.S. Highway 191, along Willow Creek, and in Soldier Summit	High impact on views from residences on Argyle Ridge, in Argyle Canyon, on Reservation Ridge, and in Soldier Summit

TABLE F-54
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Travel routes	High impact on views from Dinosaur Diamond/Indian Canyon Scenic Byways (U.S. Highway 191) Moderate impact on views from U.S. Highway 6	Similar to COUT-C	Similar impacts as COUT-C with high impact on views from Reservation Ridge Scenic Backway	Similar to COUT-C	Similar to COUT-C	Similar impacts as COUT-C with high impact on views from Argyle Canyon Road and Reservation Ridge Scenic Backway
Recreation areas	High impact on views from Crescent Regional Recreation Camp	Similar to COUT-C	Similar impacts as COUT-C with long duration views from Crescent Regional Recreation Camp	Similar to COUT-C	High impact on views from Camp Timberlane and Crescent Regional Recreation Camp	High impact on views from Camp Timberlane, Crescent Regional Recreation Camp Avintaquin Campground
Special designations	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts	No key impacts
Selective mitigation	2, 3, 4, 5, 9, and 16	2, 3, 4, 5, 9, and 16	2, 3, 4, 5, 9, and 16	2, 3, 4, 5, 9, and 16	2, 3, 4, 5, 9, and 16	2, 3, 4, 5, 7, 9, and 16
Cumulative effects	Colocation with the TransWest Express transmission line would consolidate effects on scenery and on views	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C	Similar to COUT-C
Plan Compliance						
Plan amendment (Yes or No)	No	No	Yes, ANF2	No	No	Yes, ANF1, ANF2, and VFO5

TABLE F-55
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
Affected environment	▪ 39 sites identified by the Class I inventory ▪ There are no known sites in the Project APE ▪ Unrecorded segments of the U.S. Highway 6 and a standard gauge railroad are crossed by Link U560 ▪ Key resources include Argyle Canyon Rock Art (Archaeological Sites), Soldier Summit, the U.S. Highway 6, the Emma Park Road, and the standard gauge railroad; of these resources, only unrecorded segments of the U.S. Highway 6 and the railroad are in the Project APE ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified ▪ High potential for encountering numerous unrecorded archaeological sites (primarily rock art) and historic coal	Same as COUT-C	▪ 21 sites identified by the Class I inventory ▪ There are no known sites in the Project APE ▪ Same unrecorded historic linear sites are crossed ▪ Same key resources as COUT-C with the exception of the Emma Park Road ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified ▪ Same potential for encountering unrecorded cultural resources as COUT-C	Same as COUT-C	▪ 37 sites identified by the Class I inventory ▪ There are no known sites in the Project APE ▪ Same unrecorded historic linear sites are crossed ▪ Same key resources as Variation 2 ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified ▪ Same potential for encountering unrecorded cultural resources as COUT-C	▪ 21 sites identified by the Class I inventory ▪ There are no known sites in the Project APE ▪ Same unrecorded historic linear sites are crossed ▪ Same key resources as Variation 2 with the exception of Argyle Canyon Rock Art (Archaeological Sites), which is in the Project APE (Link U513) ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified ▪ Same potential for encountering unrecorded cultural resources as COUT-C

TABLE F-55 CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES						
Focus of Comparison	**Alternative COUT-C (35.3 miles)**	**Variation 1 (34.4 miles)**	**Variation 2 (34.7 miles)**	**Variation 3 (35.3 miles)**	**Variation 4 (34.6 miles)**	**Variation 5 (33.5 miles)**
	mining sites along Minnie Maud Creek and the vicinity of Argyle Canyon					
Environmental consequences (miles crossed)	▪ 0.0 mile of high cultural resource intensity, except there are two historic linear sites in the Project APE ▪ 0.2 mile of moderate cultural resource intensity ▪ 35.1 miles of low cultural resource intensity	Compared to COUT-C, Variation 1 would include: ▪ 0.0 mile of high cultural resource intensity, except there are two historic linear sites in the Project APE ▪ Same miles of moderate cultural resource intensity ▪ 0.9 fewer mile of low cultural resource intensity	Compared to COUT-C, Variation 2 would include: ▪ 0.0 mile of high cultural resource intensity, except there are two historic linear sites in the Project APE ▪ Same miles of moderate cultural resource intensity ▪ 0.6 fewer mile of low cultural resource intensity	Compared to COUT-C, Variation 3 would include: ▪ 0.0 mile of high cultural resource intensity, except there are two historic linear sites in the Project APE ▪ Same miles of moderate and low cultural resource intensity	Compared to COUT-C, Variation 4 would include: ▪ 0.0 mile of high cultural resource intensity, except there are two historic linear sites in the Project APE ▪ An additional 0.2 miles of moderate cultural resource intensity ▪ 0.9 fewer miles of low cultural resource intensity	Compared to COUT-C, Variation 5 would include: ▪ 0.0 mile of high cultural resource intensity, except there are two historic linear sites in the Project APE ▪ An additional 0.2 miles of moderate cultural resource intensity ▪ 2.0 fewer miles of low cultural resource intensity
Selective mitigation	Specific mitigation measures for historic properties would be developed by the BLM in consultation with the consulting parties to the Programmatic Agreement, American Indian tribes, and the Project Applicant and implemented to mitigate	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C

TABLE F-55
CAMP TIMBERLANE/ARGYLE CANYON – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative COUT-C (35.3 miles)	Variation 1 (34.4 miles)	Variation 2 (34.7 miles)	Variation 3 (35.3 miles)	Variation 4 (34.6 miles)	Variation 5 (33.5 miles)
	any identified adverse impacts. These may include, but are not limited to, Project modifications and data recovery studies					
Cumulative effects	The addition of the Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C	Same as COUT-C
Plan Compliance						
Plan amendment (Yes or No)	No	No	No	No	No	No

Spanish Fork Canyon/
U.S. Highway 6

F.7 Spanish Fork Canyon/U.S. Highway 6

This variation area is located 12 miles east of Thistle, Utah, (intersection of U.S. Highway 6 and U.S. Highway 89) on U.S. Highway 6 (Map F-7). During the collaborative effort of colocating the alignments of the Project and TransWest Express transmission project, TransWest Express LLC aligned its route in a narrow window on a steep slope north of Highway 6 and south of existing transmission lines (Link U533). North of the existing transmission lines is the Tie Fork Inventoried Roadless Area in the Uinta National Forest. Because the narrow window precluded the siting of the two proposed transmission lines, the Applicant shifted its alignment to parallel U.S. Highway 6 and railroad on the south side (which would avoid potential locations of the endangered clay phacelia) then crossing to return to the slope on the north side of Highway 6 and the railroad (Link U535).

Through continued discussions with the USFS and the announcement that the TransWest Express transmission project agency preferred alternative route is located in a different area, a Project route variation was added to maintain colocation with the existing transmission lines north of U.S. Highway 6. The lands crossed by the route of Alternative COUT-C (Agency Preferred Alternative route) and the route variations are a mixture of USFS-administered and privately owned lands. Primary resource issues in this area include: special status plant potential habitat, views from U.S. Highway 6, and view from adjacent residences.

Table F-56 is a side-by-side comparison of substantive resource issues for each route variation. Table F-57 is a comparison of miles of each jurisdiction crossed by the route variations, and Table F-58 is a summary of estimated ground disturbance and vegetation clearing for the route variations. Tables F-59 to F-66 describe the inventory, impacts, and plan compliance for each resource in a side-by-side comparison of the route variations.

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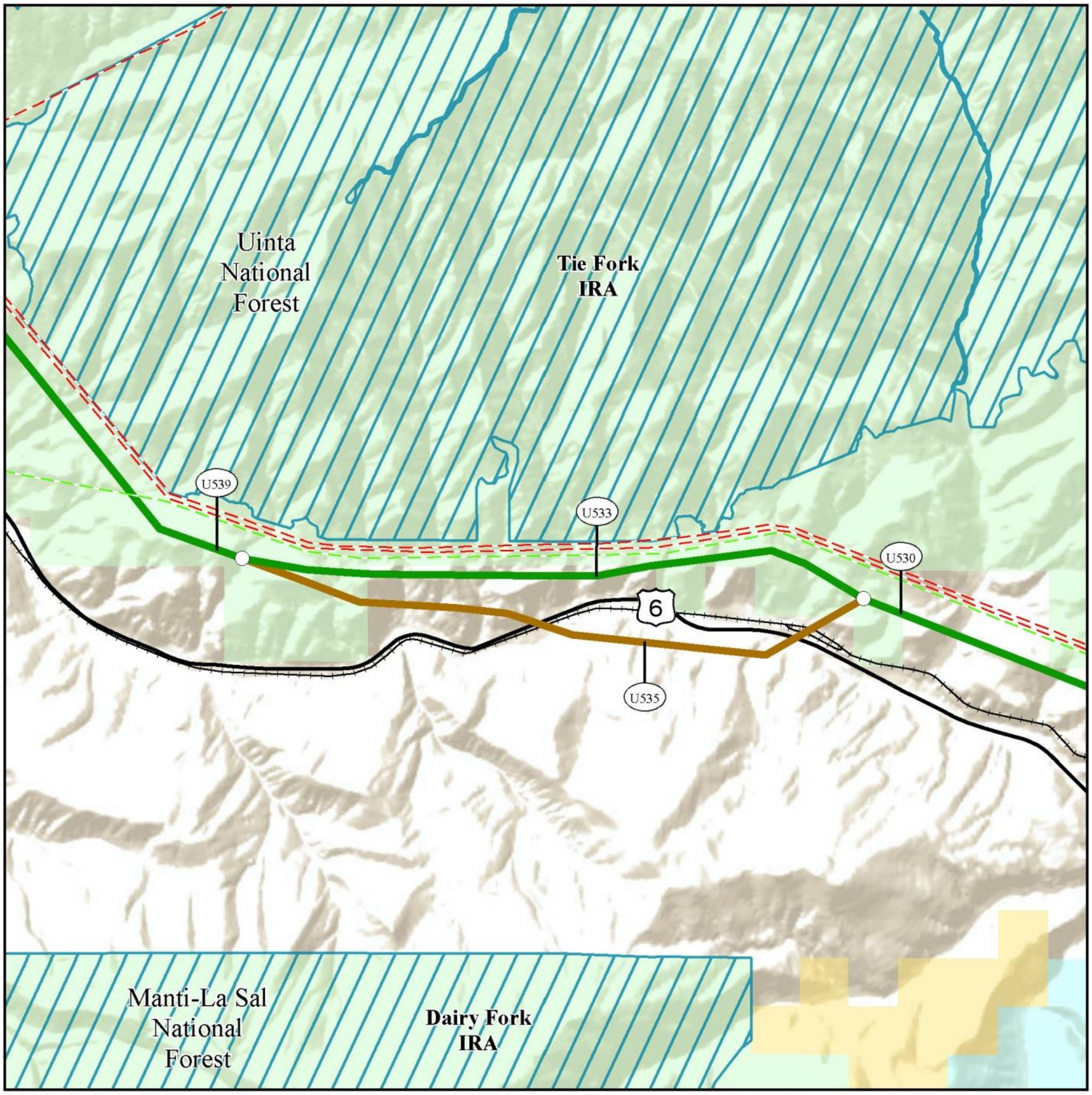

Map F-7

Spanish Fork Canyon/U.S. Highway 6

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Project Features

- 🟩 Alternative COUT-C
- 🟫 Variation 1
- ⊙- Link Number
- ○ Link Node

Land Ownership

- 🟨 Bureau of Land Management
- 🟩 U.S. Forest Service
- 🟦 State Land
- ☐ Private Land

General Reference

- – – 345kV Transmission Line
- – – 138kV Transmission Line
- ┼┼┼┼ Railroad
- ── U.S. Highway
- ▨ Inventoried Roadless Area (IRA)

SOURCES:
Land Jurisdiction, BLM 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
Highways, Roads, and Railroads, ESRI 2013;
Inventoried Roadless Areas, USFS 2012

NOTES:
- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

0 0.5 1
Miles

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TABLE F-56
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Climate and Air Quality	Due to the regional-scale of climate and air quality data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.1 for this alternative route.	Same as COUT-C
Earth Resources (miles crossed) (for detailed information, refer to Table F-59)	▪ 1.1 miles of high susceptibility to water erosion ▪ 3.3 miles of Prime Farmland ▪ 1.8 miles of oil and gas leases ▪ 2.1 miles of moderate susceptibility to landslides	▪ 0.1 mile of high susceptibility to water erosion ▪ 3.3 miles of Prime Farmland ▪ 0.9 mile of oil and gas leases ▪ 1.4 miles of moderate susceptibility to landslides
Paleontological Resources (miles crossed) (for detailed information, refer to Table F-60)	3.3 miles of PFYC 4	2.8 miles of PFYC 4
Water Resources (for detailed information, refer to Table F-61)	No critical impacts	Two crossings of the Spanish Fork River
Biological Resources		
Vegetation (for detailed information, refer to Table F-62)	No critical impacts	No critical impacts
Special Status Plants (miles crossed) (for detailed information, refer to Table F-62)	▪ 0.3 mile of moderate impacts on clay phacelia potential habitat This route would be colocated with existing transmission lines through potential clay phacelia habitat. Colocation would help reduce new surface disturbance and erosion associated with road construction. The FWS has expressed concern about the potential effects of additional development to suitable and occupied clay phacelia habitat, including the construction and operation of the Energy Gateway South and TransWest Express transmission lines (if colocated). As described in Section 3.2.6.4.2, FWS concerns relate to FWS's ability to recover the species through reintroduction becoming more limited as a result of loss of unoccupied, suitable habitat.	▪ 0.5 mile of moderate impacts on clay phacelia potential habitat ▪ 0.3 mile of low impacts on potential Ute ladies' tresses habitat This route would be only partially colocated with existing transmission lines through potential clay phacelia habitat. Colocation would help reduce new surface disturbance and erosion associated with road construction. The FWS has expressed concern about the potential effects of additional development to suitable and occupied clay phacelia habitat, including the construction and operation of the Energy Gateway South and TransWest Express transmission lines (if colocated). As described in Section 3.2.6.4.2, FWS concerns relate to FWS's ability to recover the species through reintroduction becoming more limited as a result of loss of unoccupied, suitable habitat.

TABLE F-56
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS BY RESOURCE

Resource	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Wildlife (for detailed information, refer to Table F-62)	No critical impacts	No critical impacts
Special Status Wildlife (for detailed information, refer to Table F-62)	None	0.3 mile of moderate impacts on yellow-billed cuckoo potential habitat
Migratory Birds (for detailed information, refer to Table F-62)	Due to the regional-scale of migratory bird data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.9 for this alternative route.	Similar to COUT-C
Fish and Aquatics (for detailed information, refer to Table F-62)	None	Route would make two crossings of the Spanish Fork River, which provides habitat for fish and other aquatic species.
Land Use		
Land Use (for detailed information, refer to Table F-63)	Crosses 0.2 mile of residential land resulting in a moderate residual impact	None
Parks, Preservation, and Recreation (for detailed information, refer to Table F-64)	None	None
Transportation and Access (for detailed information, refer to Table F-64)	None	None
Congressional Designations (for detailed information, refer to Table F-64)	None	None
Special Designations and Other Management Areas (for detailed information, refer to Table F-64)	None	None
Lands with Wilderness Characteristics (for detailed information, refer to Table F-64)	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas (for detailed information, refer to Table F-64)	None	None
Visual Resources (for detailed information, refer to Table F-65)	▪ Moderate impact on views from residences adjacent to U.S. Highway 6 ▪ Low impact on views from U.S. Highway 6	▪ Moderate impact on Class B scenery ▪ High impact on views from residences adjacent to U.S. Highway 6 ▪ Moderate impact on views from U.S. Highway 6

TABLE F-56 SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS BY RESOURCE		
Resource	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Cultural Resources (for detailed information, refer to Table F-66	▪ 25 sites identified by the Class I inventory; one known site in the Project APE ▪ Crosses 0.1 mile of high cultural resource intensity ▪ Key resources are the Mill Fork Cemetery, the U.S. Highway 6, and the Utah and Pleasant Valley (U&PV) Railway; these resources are outside of the Project APE	▪ Sites identified by the Class I inventory are the same as those identified for COUT-C; no known sites in the Project APE ▪ Crosses 0.0 mile of high cultural resource intensity ▪ Unrecorded segments of the U&PV and the U.S. Highway 6 are crossed in two different locations by Link U535 ▪ Same key resources as COUT-C with the exception of two unrecorded historic linear sites in the Project APE
Fire Ecology and Management	Due to the regional-scale of fire ecology and management data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.21 for this alternative route.	Same as COUT-C
Social and Economic Conditions	Effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.22 for this alternative route.	Same as COUT-C
Public Health (EMF)	Due to the scale of public health data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.23 for this alternative route.	Same as COUT-C

TABLE F-57
SPANISH FORK CANYON/U.S. HIGHWAY 6 – 500-KILOVOLT TRANSMISSION LINE PARALLEL CONDITIONS AND JURISDICTION BY ROUTE VARIATION

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Jurisdiction (miles crossed)		
BLM	0.0	0.0
USFS	1.8	0.9
NPS	0.0	0.0
State	0.0	0.0
Tribal	0.0	0.0
Private	1.5	2.4

TABLE F-58
SPANISH FORK CANYON/U.S. HIGHWAY 6 – SUMMARY OF ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING FOR THE 500-KILOVOLT TRANSMISSION LINE AND SERIES COMPENSATION STATIONS

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Temporary disturbance (acres)[1, 4]	37	37
Permanent disturbance (acres)[2, 4]	25	25
Total disturbance (acres)	61	61
Transmission-line right-of-way vegetation clearing (acres)[3, 4]	10	10
Access Roads		
Existing (miles)[5]	3.3	3.3
New (miles)[6]	0.0	0.0

SOURCE: Assumptions for the calculations are derived from the Applicant's description of the Project (Appendix B).

NOTES:

[1] Temporary disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure), wire tensioning/pulling sites (250 by 400 feet; two every 3-5 miles), wire splicing sites (100 by 100 feet every 9,000 feet), multi-purpose construction yards (30-acre site located approximately every 20 miles), helicopter fly yards (15-acre site; located approximately every 5 miles), guard structures (150 by 75 feet; approximately 1.4 structures per 1 mile), and temporary access roads (refer to Table 2-1).

[2] Permanent disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (60 by 60 feet per structure), communication regeneration stations (100 by 100 feet, one station approximately every 55 miles), series compensation stations, and permanent access roads (refer to Tables 2-1 and 2-2).

[3] Right-of-way vegetation clearing: vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, mountain forest, mountain shrub, pinyon-juniper, and riparian), and overlap with other disturbance in the Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes and route variations at this time and is required to accurately identify locations of temporary and permanent access roads. Temporary and permanent disturbance calculations include estimated disturbance for all access roads.

[4] Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, columns may not sum exactly.

[5] Miles of the reference centerline that are anticipated to use existing and/or improved existing access roads.

[6] Miles of the reference centerline that are anticipated to use newly constructed and/or overland access.

TABLE F-59
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Geologic Hazards		
Affected environment (miles crossed)	▪ Crosses no mine subsidence ▪ Crosses all low flood hazard ▪ 2.1 miles of moderate susceptibility to landslides	▪ Crosses no mine subsidence ▪ Crosses all low flood hazard ▪ 1.4 miles of moderate susceptibility to landslides
Environmental consequences	Crosses more miles of moderate landslide susceptibility	Crosses fewer miles of moderate landslide susceptibility
Selective mitigation	None	None
Cumulative effects	Could have incremental impacts on areas prone to landslides	Same as COUT-C
Soil Resources		
Affected environment (miles crossed)	▪ 1.1 miles of high susceptibility to water erosion ▪ 1.1 miles of moderate susceptibility to water erosion ▪ 1.1 miles of moderate susceptibility to wind erosion ▪ 3.3 miles of Prime or Unique Farmland	▪ 0.1 mile of high susceptibility to water erosion ▪ 0.9 mile of moderate susceptibility to water erosion ▪ 0.9 mile of moderate susceptibility to wind erosion ▪ 3.3 miles of Prime or Unique Farmland
Environmental consequences	Greater impact on soils with moderate and high susceptibility to wind and water erosion	Lower impacts on soils
Selective mitigation	1, 3, 7, and 13	1, 3, 7, and 13
Cumulative effects	Could have incremental impacts on Prime Farmlands and soils with moderate and high susceptibility to wind and water erosion	Same as COUT-C
Mineral Resources		
Affected environment (miles crossed)	▪ Crosses no active mines or producing wells ▪ 1.8 miles of oil and gas leases	▪ Crosses no active mines or producing wells ▪ 0.9 mile of oil and gas leases
Environmental consequences	Crosses twice as much oil and gas leases as Variation 1	Crosses less miles with oil and gas leases
Selective mitigation	None	None
Cumulative effects	Could have incremental impacts on leases	Same as COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-60
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Affected Environment		
PFYC formations	PFYC 2 and 4	Same as COUT-C
Known locality density within 1.0 mile of the centerline	Low	Same as COUT-C

TABLE F-60
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Environmental Consequences		
PFYC formations (miles crossed)	3.3 miles of PFYC 4	2.8 miles of PFYC 4
Percent of route crossing PFYC 4	100	85
Impacts on paleontological resources anticipated	Could be high	Same as COUT-C
Selective mitigation	None	None
Cumulative effects	Could have incremental impacts on paleontological resources	Same
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-61
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Affected Environment		
Class 1: Outstanding waters	7 crossings	3 crossings
Class 4: State-listed impaired waters	None	2 crossings
Palustrine emergent wetlands	None	None
Palustrine forested overstory wetlands	None	None
Palustrine scrub/shrub wetlands	None	None
Perennial stream/river	None	2 crossings of Spanish Fork River, which is not crossed by COUT-C
Intermittent stream	7 crossings	5 crossings
Riparian areas	None	5 crossings
Swamp/marsh/estuary	None	None
Well/spring	None	None
Environmental Consequences		
Residual impacts (miles crossed)	0.9 miles of low impacts	0.3 miles of moderate impacts 1.0 mile of low impacts
Selective mitigation	1, 2, 7, and 11	1, 2, 7, and 11
Cumulative effects	Project would be located in the vicinity of existing high-voltage transmission lines and the proposed TransWest Express transmission line (if colocated) leading to minor incremental impacts on water resources in the area	Project would be located on the opposite side of U.S. Highway 6 from the existing transmission lines and the proposed TransWest Express transmission line (if colocated) leading to more incremental impacts on water resources in the area.

TABLE F-61
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-62
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Vegetation		
Affected environment (miles of vegetation communities crossed)	▪ 0.2 mile of barren ▪ 0.2 mile of big sagebrush ▪ 0.3 mile of mountain shrub ▪ 0.6 mile of pinyon-juniper	▪ 0.3 mile of barren ▪ 0.2 mile of big sagebrush ▪ 0.1 mile of developed ▪ 2.4 miles of pinyon-juniper ▪ 0.3 mil of riparian
Environmental consequences (miles crossed)	▪ 0.7 mile of moderate impacts ▪ 2.6 miles of low-moderate impacts	▪ 0.5 mile of moderate impacts ▪ 0.7 mile of low-moderate impacts
Selective mitigation	None	1, 2, 4, and 7
Cumulative effects	Project would be located in the vicinity of existing high-voltage transmission lines and the proposed TransWest Express transmission line (if colocated) leading to minor incremental impacts on vegetation resources in the area	Project would be located on the opposite side of U.S. Highway 6 from the existing transmission lines and the proposed TransWest Express transmission line (if collocated) leading to more incremental impacts on vegetation resources in the area.
Special Status Plants		
Affected environment (miles crossed)	▪ 0.3 mile of clay phacelia potential habitat ▪ No known clay phacelia sites or reintroduction areas are within 650 feet of this route.	▪ 0.5 mile of clay phacelia potential habitat ▪ 0.3 mile of Ute ladies'-tresses potential habitat (associated with Spanish Fork River) ▪ No known clay phacelia sites or reintroduction areas are within 650 feet of this route.
Environmental consequences (miles crossed)	▪ 0.3 miles of moderate impacts ▪ Route would be colocated with existing transmission lines through potential clay phacelia habitat. Colocation would help reduce new surface disturbance and erosion associated with road construction	▪ 0.5 miles of moderate impacts ▪ 0.3 miles of low impacts ▪ Route would be only partially colocated with existing transmission lines through potential clay phacelia habitat. Colocation would help reduce new surface disturbance and erosion associated with road construction
Selective mitigation	2, 3, and 7	2, 3, and 7

TABLE F-62
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Cumulative effects	Project would be located in the vicinity of existing high-voltage transmission lines and the proposed TransWest Express transmission project (if colocated) leading to incremental impacts on clay phacelia habitat; the FWS has expressed concern about the potential effects of additional development to suitable and occupied clay phacelia habitat, including the construction and operation of the Energy Gateway South and TransWest Express transmission lines (if colocated). As described in Section 3.2.6.4.2, FWS concerns relate to FWS' ability to recover the species through reintroduction becoming more limited as a result of loss of unoccupied, suitable habitat.	Project would be located on the opposite side of U.S. Highway 6 from the existing transmission lines and the proposed TransWest Express transmission line (if colocated) leading to more incremental impacts on clay phacelia habitat; the FWS has expressed concern about the potential effects of additional development to suitable and occupied clay phacelia habitat, including the construction and operation of the Energy Gateway South and TransWest Express transmission lines (if colocated). This route may also incrementally affect potential Ute ladies' tresses habitat. As described in Section 3.2.6.4.2, FWS concerns relate to FWS' ability to recover the species through reintroduction becoming more limited as a result of loss of unoccupied, suitable habitat.
Wildlife		
Affected environment (miles crossed)	▪ 3.0 miles of elk crucial winter range ▪ 3.3 miles of mule deer crucial winter range	▪ 1.9 miles of elk crucial winter range ▪ 1.2 miles of moose crucial year-long range ▪ 1.2 miles of moose calving grounds ▪ 1.7 miles of mule deer crucial winter range
Environmental consequences (miles crossed)	3.3 miles of low impacts	3.3 miles of low impacts
Selective mitigation	12 and 15	12 and 15
Cumulative effects	Project would be located in the vicinity of existing high-voltage transmission lines and the proposed TransWest Express transmission line (if colocated) leading to minor incremental impacts on wildlife	Project would be located on the opposite side of U.S. Highway 6 from the existing transmission lines and proposed TransWest Express transmission line (if collocated) leading to more incremental impacts on wildlife
Special Status Wildlife		
Affected environment (miles crossed)	No special status wildlife crossed	0.3 mile of yellow-billed cuckoo potential habitat
Environmental consequences (miles crossed)	None	0.3 miles of moderate residual impacts
Selective mitigation	None	2, 4, 5, 7, and 12
Cumulative effects	None	Project would contribute incrementally to the existing impacts on potential yellow-billed cuckoo habitat in Spanish Fork Canyon.

TABLE F-62
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Fish and Aquatics		
Affected environment	No specific resources analyzed in detail in the EIS were identified in this area.	No specific resources analyzed in detail in the EIS were identified in this area, though this variation would make 2 crossings of the Spanish Fork River, which provides habitat for fish and aquatic species.
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-63
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Utility Corridors (miles)		
Designated (BLM and USFS)	1.4	0.3
West-wide Energy Corridor	1.8	0.9
Parallel Linear Facilities (miles)		
500kV	0.0	0.0
345kV	3.3	1.8
138kV	3.3	1.9
230kV	0.0	0.0
Pipeline	0.0	0.0
Existing Land Use		
Environmental Consequences	Crosses 0.2 mile of residential land resulting in a moderate residual impact	No key impacts
Selective mitigation	7	None
Cumulative effects	Short-term cumulative effects of the Project in addition to any past/present and RFFAs could limit and/or alter access to existing residence(s) and noise may be produced during construction of the project. Long-term cumulative effects could restrict use of property where projects occur on private lands.	None
Authorized Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None

TABLE F-63 SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING, AND GENERAL PLAN MANAGEMENT DIRECTION		
Focus of Comparison	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Cumulative effects	None	None
Future Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Zoning and General Plan Management Direction[1]		
Generalized permitting	No key permitting requirements	No key permitting requirements
Selective mitigation	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No
NOTE: [1]Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city or county. The generalized permitting is for disclosure and comparison only.		

TABLE F-64 SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; CONGRESSIONAL DESIGNATIONS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS		
Focus of Comparison	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Parks, Preservation, and Recreation		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Transportation and Access		
Affected environment	Crosses other roadways	Crosses U.S. Highway 6 twice and a railroad twice.
Environmental consequences	See Section 3.2.13 for information on effects common to all alternatives.	Same as COUT–C with the addition that moderate impacts would be anticipated where temporary closures and/or delays would occur from construction of the project when crossing roadways and railroads (e.g. U.S. Highway 6)
Selective mitigation	None	5 and 9
Cumulative effects	Not applicable	Not applicable
Congressional Designations		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None

TABLE F-64 SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; CONGRESSIONAL DESIGNATIONS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS		
Focus of Comparison	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Special Designations and Other Management Areas		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Lands with Wilderness Characteristics		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas		
Affected environment	None	None
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-65 SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES		
Focus of Comparison	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Affected Environment		
Scenery (miles crossed)	▪ 3.3 miles of Class B	▪ 3.3 miles of Class B
High concern viewers (miles crossed)	▪ 1.9 miles of views within 0.5 mile ▪ 1.5 miles of views between 0.5 mile and 1.0 mile	▪ 1.9 miles of views within 0.5 mile ▪ 1.4 miles of views between 0.5 mile and 1.0 mile
Moderate concern viewers (miles crossed)	▪ 3.1 miles of views within 0.5 mile ▪ 0.3 miles of views within 0.5 miles and 1.0 miles	▪ 3.2 miles of views within 0.5 mile ▪ 0.1 mile of views within 0.5 miles and 1.0 miles
Federal Agency Visual Management Objectives (miles crossed)	▪ 1.6 miles of USFS Partial Retention VQO ▪ 0.3 mile of USFS Modification VQO	▪ 0.2 mile of USFS Retention VQO ▪ 0.3 mile of USFS Partial Retention VQO ▪ 0.3 mile of USFS Modification VQO

TABLE F-65 SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES		
Focus of Comparison	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Environmental Consequences		
Scenery	No key impacts	Moderate impact on Class B scenery
Residences	Moderate impact on views from residences adjacent to U.S. Highway 6	High impact on views from residences adjacent to U.S. Highway 6
Travel routes	Low impact on views from U.S. Highway 6 due to proximity to existing transmission lines	Moderate impact on views from U.S. Highway 6 due to the double crossing of the highway
Recreation areas	No key impacts	No key impacts
Special designations	No key impacts	No key impacts
Selective mitigation	3, 4, 8, and 16	3, 4, and 16
Cumulative effects	Colocation with the TransWest Express transmission line would consolidate effects on scenery and on views	Due to separation from existing transmission lines, more expansive cumulative effects on scenery and increased impacts on views from U.S. Highway 6
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-66 SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES		
Focus of Comparison	**Alternative COUT-C Link U533 (3.3 miles)**	**Variation 1 Link U535 (3.3 miles)**
Affected environment	▪ 25 sites identified by the Class I inventory ▪ One known site in the Project APE ▪ Key resources include the Mill Fork Cemetery, U.S. Highway 6, and the U&PV Railway; these resources are outside of the Project APE ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified	▪ Class I sites potentially affected by Variation 1 are the same as those identified for COUT-C ▪ There are no known sites in the Project APE ▪ Unrecorded segments of the U&PV and U.S. Highway 6 are crossed in two different locations by Link U535 ▪ Same key resources as COUT-C with the exception of unrecorded segments of the two historic linear sites in the Project APE ▪ No NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified
Environmental consequences (miles crossed)	▪ 0.1 miles of high cultural resource intensity ▪ 0.2 miles of moderate cultural resource intensity ▪ 3.0 miles of low cultural resource intensity	▪ 0.0 mile of high cultural resource intensity, except there are two historic linear sites in the Project APE ▪ 0.2 miles of moderate cultural resource intensity ▪ 3.1 miles of low cultural resource intensity

TABLE F-66
SPANISH FORK CANYON/U.S. HIGHWAY 6 – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative COUT-C Link U533 (3.3 miles)	Variation 1 Link U535 (3.3 miles)
Selective mitigation	▪ Specific mitigation measures for historic properties would be developed by the BLM in consultation with the consulting parties to the Programmatic Agreement, American Indian tribes, and the Project Applicant and implemented to mitigate any identified adverse impacts. These may include, but are not limited to, Project modifications and data recovery studies	▪ Same as COUT-C
Cumulative effects	▪ The addition of the Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources.	▪ Same as COUT-C
Plan Compliance		
Plan amendment (Yes or No)	No	No

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Chipman Creek

F.8 Chipman Creek

This variation area is located near the Wasatch-Utah county line on the Uinta National Forest approximately 20 miles southwest of Fruitland, Utah (Map F-8). The original route (Link U428) parallels an existing 345kV transmission line adjacent to the southern edge of the Chipman Creek IRA as part of Alternative COUT-A (not the Agency Preferred Alternative route). Variation 1 (Link U429) was developed to avoid the IRA. On the east side of the IRA, the route turns to the southwest, crosses the 345kV transmission line, turns to parallel the 345kV line, then turns to the northwest, crosses the 345kV line again and rejoins the original route on the east side of the IRA.

All lands crossed by the routing options are administered by the USFS. Primary resource issues in this area include IRA roadless and wilderness characteristics, White River/Strawberry Road Scenic Backway, and partial retention Visual Quality Objectives.

Table F-67 is a side-by-side comparison of substantive resource issues for each route variation.
Table F-68 is a comparison of miles of each jurisdiction crossed by the route variations, and Table F-69 is a summary of estimated ground disturbance and vegetation clearing for the route variations. Tables F-70 to F-77 describe the inventory, impacts, and plan compliance for each resource in a side-by-side comparison of route variations.

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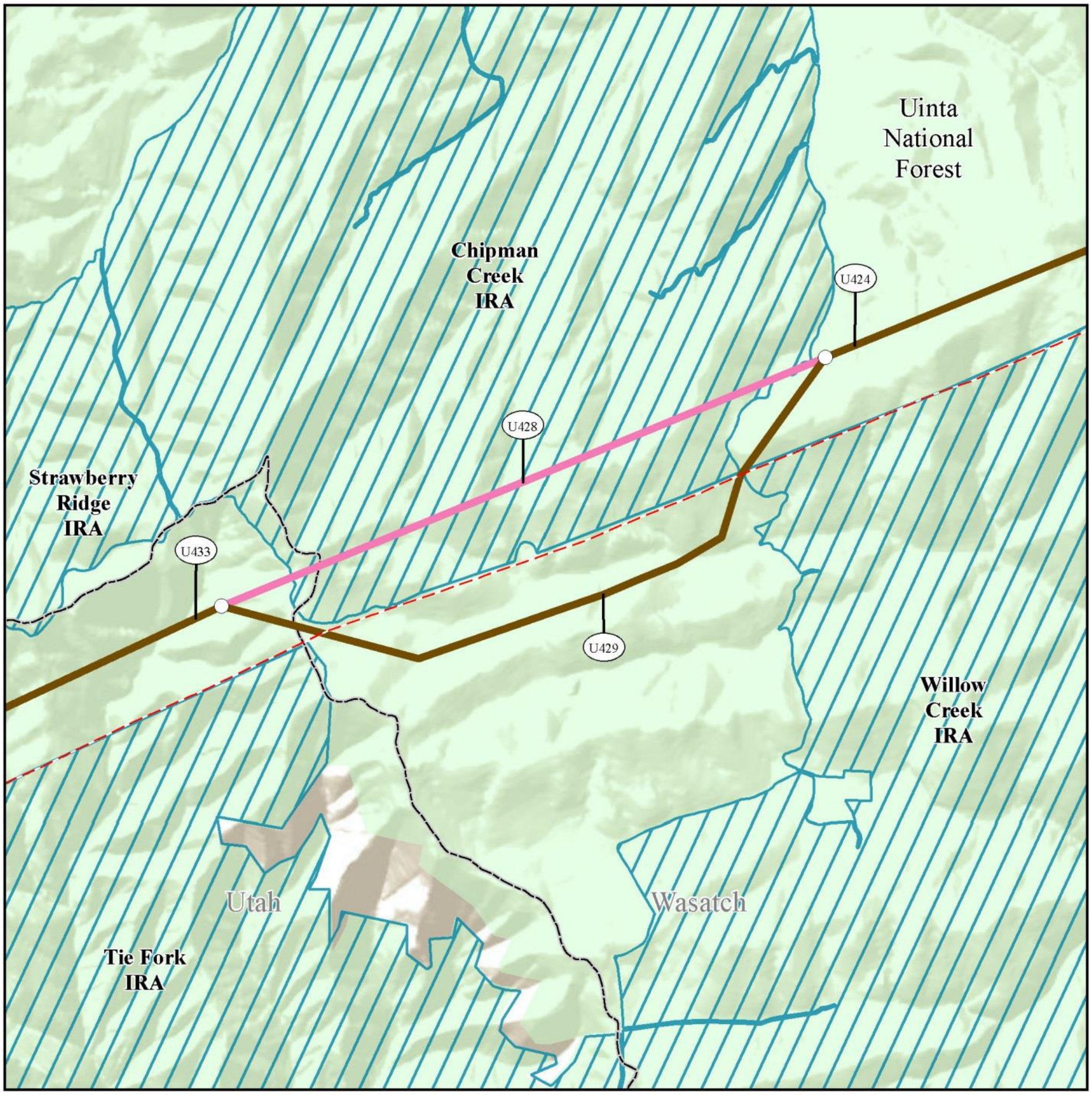

Map F-8

Chipman Creek

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Project Features

▬	Alternative COUT-A
▬	Variation 1
⬭-	Link Number
○	Link Node

Land Ownership

🟩	U.S. Forest Service
☐	Private Land

General Reference

– –	345kV Transmission Line
☐	County Boundary
▨	Inventoried Roadless Area (IRA)

SOURCES:
Land Jurisdiction, BLM 2013;
Transmission Lines and Substations as digitized by EPG, POWERmap Platts 2009;
County Boundaries, ESRI 2013
Inventoried Roadless Areas, USFS 2012

NOTES:
- The alternative routes shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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Miles

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TABLE F-67 CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS BY RESOURCE		
Resource	**Alternative COUT-A Link U429 (3.8 miles)**	**Variation 1 Link U428 (3.4 miles)**
Climate and Air Quality	Due to the regional-scale of climate and air quality data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-A are consistent with those described in Section 3.2.1 for this alternative route.	Same as COUT-A
Earth Resources (miles crossed) (for detailed information, refer to Table F-70)	0.4 mile of high susceptibility to water erosion	▪ 0.6 mile of high susceptibility to water erosion ▪ 0.6 mile of moderate susceptibility to wind erosion
Paleontological Resources (for detailed information, refer to Table F-71)	Entire route crosses areas with PFYC 4 and 5	Entire route crosses areas with PFYC 4 and 5
Water Resources (for detailed information, refer to Table F-72)	No critical issues	No critical issues
Biological Resources		
Vegetation (for detailed information, refer to Table F-73)	No critical issues	No critical issues
Special Status Plants (for detailed information, refer to Table F-73)	None	None
Wildlife (for detailed information, refer to Table F-73)	No critical issues	No critical issues
Special Status Wildlife (for detailed information, refer to Table F-73)	None	None
Migratory Birds (for detailed information, refer to Table F-73)	Due to the regional-scale of migratory bird data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-A are consistent with those described in Section 3.2.9 for this alternative route.	Similar to COUT-A
Fish and Aquatics (for detailed information, refer to Table F-73)	None	None
Land Use		
Land Use (for detailed information, refer to Table F-74)	None	None
Parks, Preservation, and Recreation areas (for detailed information, refer to Table F-75)	Crosses 0.4 mile of the White River/Strawberry Road scenic backway.	Crosses 0.5 mile of the White River/Strawberry Road scenic backway.
Transportation and Access (for detailed information, refer to Table F-75)	None	None

TABLE F-67 CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS BY RESOURCE		
Resource	**Alternative COUT-A Link U429 (3.8 miles)**	**Variation 1 Link U428 (3.4 miles)**
Congressional Designations (for detailed information, refer to Table F-75)	None	None
Special Designations and Other Management Areas (for detailed information, refer to Table F-75)	None	None
Lands with Wilderness Characteristics (for detailed information, refer to Table F-75)	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas (for detailed information, refer to Table F-75)	Low impacts on Chipman Creek and Willow Creek IRAs	Moderate impacts on Chipman Creek IRA
Visual Resources (for detailed information, refer to Table F-76	Moderate impact on Class B scenery High impact on views from White River/Strawberry Road Scenic Backway	Similar to COUT-A
Cultural Resources (for detailed information, refer to Table F-77)	Two sites identified by the Class I inventory; no known sites in the Project APE 0.0 mile of high cultural resource intensity No key resources were identified	Same as COUT-A
Fire Ecology and Management	Due to the regional-scale of fire ecology and management data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-C are consistent with those described in Section 3.2.21 for this alternative route.	Same as COUT-A
Social and Economic Conditions	Effects associated with this portion of Alternative COUT-A are consistent with those described in Section 3.2.22 for this alternative route.	Same as COUT-A
Public Health (EMF)	Due to the scale of public health data and the associated analysis for the Project, effects associated with this portion of Alternative COUT-A are consistent with those described in Section 3.2.23 for this alternative route.	Same as COUT-A

TABLE F-68
CHIPMAN CREEK – 500-KILOVOLT TRANSMISSION LINE PARALLEL CONDITIONS AND JURISDICTION BY ROUTE VARIATION

Focus of Comparison	Alternative **COUT-A** **Link U429 (3.8 miles)**	**Variation 1** **Link U428 (3.4 miles)**
Jurisdiction (miles crossed)		
BLM	0.0	0.0
USFS	3.8	3.4
NPS	0.0	0.0
State	0.0	0.0
Tribal	0.0	0.0
Private	0.0	0.0

TABLE F-69
CHIPMAN CREEK – SUMMARY OF ESTIMATED GROUND DISTURBANCE AND VEGETATION CLEARING FOR THE 500-KILOVOLT TRANSMISSION LINE AND SERIES COMPENSATION STATIONS

Focus of Comparison	Alternative **COUT-A** **Link U429 (3.8 miles)**	**Variation 1** **Link U428 (3.4 miles)**
Temporary disturbance (acres)[1, 4]	36	56
Permanent disturbance (acres)[2, 4]	30	9
Total disturbance (acres)	66	65
Transmission-line right-of-way vegetation clearing (acres)[3, 4]	51	83
Access Roads		
Existing (miles)[5]	3.3	0.6
New (miles)[6]	0.5	2.8

SOURCE: Assumptions for the calculations are derived from the Applicant's description of the Project (Appendix B).

NOTES:

[1] Temporary disturbance: Estimated area of disturbance associated with structure work areas (250 by 250 feet per structure), wire tensioning/pulling sites (250 by 400 feet; two every 3-5 miles), wire splicing sites (100 by 100 feet every 9,000 feet), multi-purpose construction yards (30-acre site located approximately every 20 miles), helicopter fly yards (15-acre site; located approximately every 5 miles), guard structures (150 by 75 feet; approximately 1.4 structures per 1 mile), and temporary access roads (refer to Table 2-1).

[2] Permanent disturbance: Estimated area of disturbance associated with the area occupied by structures (pads) (60 by 60 feet per structure), communication regeneration stations (100 by 100 feet, one station approximately every 55 miles), series compensation stations, and permanent access roads (refer to Tables 2-1 and 2-2).

[3] Right-of-way vegetation clearing: vegetation clearing has been estimated in the transmission line right-of-way only. Calculations only include vegetation types with the potential to grow more than 5 feet tall (aspen, mountain forest, mountain shrub, pinyon-juniper, and riparian), and overlap with other disturbance in the Project right-of-way. Vegetation clearing was not calculated for access roads due to the access road design not being available for the alternative routes and route variations at this time and is required to accurately identify locations of temporary and permanent access roads. Temporary and permanent disturbance calculations include estimated disturbance for all access roads.

[4] Disturbance calculations include an additional 5 percent contingency. Acres in table are rounded; therefore, columns may not sum exactly.

[5] Miles of the reference centerline that are anticipated to use existing and/or improved existing access roads.

[6] Miles of the reference centerline that are anticipated to use newly constructed and/or overland access.

TABLE F-70 CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR EARTH RESOURCES		
Focus of Comparison	**Alternative COUT-A Link U429 (3.8 miles)**	**Variation 1 Link U428 (3.4 miles)**
Geologic Hazards		
Affected environment (miles crossed)	▪ Crosses no mine subsidence ▪ Crosses all low flood hazard ▪ 2.1 miles of moderate susceptibility to landslides	▪ Crosses no mine subsidence ▪ Crosses all low flood hazard ▪ 1.4 miles of moderate susceptibility to landslides
Environmental consequences	Mostly low impacts for geologic hazards, but has greater amount of moderate susceptibility to landslides	Mostly low impacts for geologic hazards, and less amount of moderate susceptibility to landslides
Selective mitigation	None	None
Cumulative effects	Could have incremental impacts on areas prone to landslides	Same as COUT-A
Soil Resources		
Affected environment (miles crossed)	▪ 0.4 mile of moderate susceptibility to water erosion ▪ Crosses all low susceptibility to wind erosion ▪ Crosses no Prime or Unique Farmland	▪ 0.6 miles of moderate susceptibility to water erosion ▪ 0.6 miles of moderate susceptibility to wind erosion ▪ Crosses no Prime or Unique Farmland
Environmental consequences	Would have least impacts on soils susceptible to erosion	Would have greater impact on soil resources than COUT-A
Selective mitigation	1, 3, 7, and 13	1, 3, 7, and 13
Cumulative effects	Could have incremental impacts on soils susceptible to water erosion	Could have incremental impacts on soils susceptible to wind and water erosion
Mineral Resources		
Affected environment (miles crossed)	▪ 0.1 mile of active mines or producing wells ▪ 3.8 miles of permitted mines, coal lases, oil and gas leases, or geothermal leases	▪ Crosses no active mines or producing wells ▪ 3.4 miles of permitted mines, coal lases, oil and gas leases, or geothermal leases
Environmental consequences	Would have greater impact on mineral resources than Variation 1	Would have least impacts on mineral resources
Selective mitigation	2 and 7	None
Cumulative effects	Could have incremental impacts on oil and gas leases and producing wells	Could have incremental impacts on oil and gas leases
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-71 CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES		
Focus of Comparison	**Alternative COUT-A Link U429 (3.8 miles)**	**Variation 1 Link U428 (3.4 miles)**
Affected Environment		
PFYC formations	PFYC 4 and 5	Same as COUT-A
Known locality density within 1.0 mile of the centerline	Low	Low

TABLE F-71
CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR PALEONTOLOGICAL RESOURCES

Focus of Comparison	**Alternative COUT-A Link U429 (3.8 miles)**	**Variation 1 Link U428 (3.4 miles)**
Environmental Consequences		
PFYC formations	Entire route crosses areas with PFYC 4 and 5	Same as COUT-A
Percent of route crossing PFYC 4 and 5	100	100
Impacts on paleontological resources anticipated	Could be high	Could be high
Selective mitigation	None	None
Cumulative effects	Could have incremental impacts on paleontological resources	Same as COUT-A
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-72
CHIPMAN CREEK –COMPARISON OF ROUTE VARIATIONS FOR WATER RESOURCES

Focus of Comparison	**Alternative COUT-A Link U429 (3.8 miles)**	**Variation 1 Link U428 (3.4 miles)**
Affected Environment		
Class 1: Outstanding waters	2 crossings	1 crossing
Class 4: State-listed impaired waters	2 crossings	1 crossing
Palustrine emergent wetlands	None	None
Palustrine forested overstory wetlands	None	None
Palustrine scrub/shrub wetlands	None	None
Perennial stream/river	None	None
Intermittent stream	2 crossings	1 crossing
Riparian areas	5 crossings	9 crossings
Swamp/marsh/estuary	None	None
Well/spring	None	None
Environmental Consequences		
Residual impacts (miles crossed)	1.6 miles of low impacts	2.4 miles of low impacts
Selective mitigation	1, 2, 7, and 11	1, 2, 7, and 11
Cumulative effects	▪ Colocated with an existing high-voltage transmission line and the proposed TransWest Express transmission line (if collocated) ▪ Incremental contribution to the effects on water resources in the area	Similar to COUT-A
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-73 CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES		
Focus of Comparison	**Alternative COUT-A Link U429 (3.8 miles)**	**Variation 1 Link U428 (3.4 miles)**
Vegetation		
Affected environment (miles of vegetation crossed)	▪ 0.2 mile of alpine ▪ 1.5 miles of aspen ▪ 1.8 miles of big sagebrush ▪ 0.1 mile of montane forest ▪ 0.2 mile of riparian	▪ 2.1 miles of aspen ▪ 0.1 mile of barren ▪ 0.1 mile of big sagebrush ▪ 0.5 mile of montane forest ▪ 0.6 mile of riparian
Environmental consequences (miles crossed)	▪ 0.6 mile of moderate-high impacts ▪ 2.8 miles of moderate impacts	▪ 0.2 mile of moderate-high impacts ▪ 3.6 miles of moderate impacts
Selective mitigation	1, 2, 4, and 7	1, 2, 4, and 7
Cumulative effects	This variation would be collocated with an existing high-voltage transmission line and the proposed TransWest Express transmission line (if collocated). The Project would have an incremental contribution to the effects on vegetation in the area.	Similar to COUT-A
Special Status Plants		
Affected environment (miles crossed)	No identifiable special status plant habitat crossed.	No identifiable special status plant habitat crossed.
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Wildlife		
Affected environment (miles crossed)	▪ 3.8 miles of elk crucial spring/fall range ▪ 3.8 miles of moose crucial spring/fall range ▪ 3.8 miles of mule deer crucial summer range	▪ 3.4 miles of elk crucial spring/fall range ▪ 3.4 miles of moose crucial spring/fall range ▪ 3.4 miles of mule deer crucial summer range
Environmental consequences (miles crossed)	3.8 miles of low impacts	3.4 miles of low impacts
Selective mitigation	12 and 15	12 and 15
Cumulative effects	This variation would be collocated with an existing high-voltage transmission line and the proposed TransWest Express transmission line (if collocated). The Project would have an incremental contribution to the effects on wildlife in the area.	Similar to COUT-A
Special Status Wildlife		
Affected environment (miles crossed)	No specific resources analyzed in detail in the EIS were identified in this area.	Similar to COUT-A
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None

TABLE F-73
CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR BIOLOGICAL RESOURCES

Focus of Comparison	Alternative COUT-A Link U429 (3.8 miles)	Variation 1 Link U428 (3.4 miles)
Fish and Aquatics		
Affected environment	No specific resources analyzed in detail in the EIS were identified in this area.	Same as COUT-A
Environmental consequences	None	None
Selective mitigation	None	None
Cumulative effects	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-74
CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR LAND USE (EXISTING, AUTHORIZED, AND FUTURE), ZONING AND GENERAL PLAN MANAGEMENT DIRECTION

Focus of Comparison	Alternative COUT-A Link U429 (3.8 miles)	Variation 1 Link U428 (3.4 miles)
Utility Corridors (miles)		
Designated (BLM and USFS)	0.1	0.0
West-wide Energy Corridor	3.8	0.6
Parallel Linear Facilities (miles)		
500kV	0.0	0.0
345kV	3.8	1.5
138kV	0.0	0.0
230kV	0.0	0.0
Pipeline	0.0	0.0
Existing Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Authorized Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Future Land Use		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Zoning and General Plan Management Direction[1]		
Generalized permitting	No key permitting requirements	No key permitting requirements.
Selective mitigation	None	None
Plan Compliance		
Plan amendment (Yes or No)	No	Yes, UNF1

NOTEs: [1] Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city or county. The generalized permitting is for disclosure and comparison only.

TABLE F-75
CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR PARKS, PRESERVATION, AND RECREATION; TRANSPORTATION AND ACCESS; SPECIAL DESIGNATIONS AND OTHER MANAGEMENT AREAS; CONGRESSIONAL DESIGNATIONS; LANDS WITH WILDERNESS CHARACTERISTICS; AND INVENTORIED ROADLESS AREAS AND UNROADED/UNDEVELOPED AREAS

Focus of Comparison	Alternative COUT-A Link U429 (3.8 miles)	Variation 1 Link U428 (3.4 miles)
Parks, Preservation, and Recreation areas		
Affected environment and consequences	Crosses 0.4 mile of the White River/Strawberry Road scenic backway.	Crosses 0.5 mile of the White River/Strawberry Road scenic backway.
Selective mitigation	None	None
Cumulative effects	None	None
Transportation and Access		
Affected environment	Crosses other roadways	Crosses other roadways
Environmental consequences	See Section 3.2.13 for information on effects common to all alternatives.	Same as COUT-A
Selective mitigation	5 and 9	5 and 9
Cumulative effects	Not applicable	Not applicable
Congressional Designations		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Special Designations and Other Management Areas		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Lands with Wilderness Characteristics		
Affected environment and consequences	No key impacts	No key impacts
Selective mitigation	None	None
Cumulative effects	None	None
Inventoried Roadless Areas and Unroaded/Undeveloped Areas		
Affected environment (miles crossed)	0.1 mile of Chipman Creek IRA 0.1 mile of Willow Creek IRA	3.1 miles of Chipman Creek IRA
Environmental consequences	Low impacts on Chipman Creek and Willow Creek IRA attributes	Moderate impacts on Chipman Creek IRA attributes
Selective mitigation	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, and 16	1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, and 16
Cumulative effects	Colocation with the TransWest Express transmission line would consolidate effects on IRAs	Colocation with the TransWest Express transmission Project would consolidate effects on IRAs
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-76
CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR VISUAL RESOURCES

Focus of Comparison	Alternative COUT-A Link U429 (3.8 miles)	Variation 1 Link U428 (3.4 miles)
Affected Environment		
Scenery (miles crossed)	▪ 3.8 miles of Class B	▪ 3.4 miles of Class B
High concern viewers (miles crossed)	▪ 1.4 miles of views within 0.5 mile ▪ 0.7 mile of views within 0.5 miles and 1.0 miles	▪ 1.1 miles of views within 0.5 mile ▪ 0.7 mile of views within 0.5 miles and 1.0 miles
Moderate concern viewers (miles crossed)	▪ 3.8 miles of views within 0.5 mile ▪ 0.0 mile of views between 0.5 mile and 1.0 mile	▪ 3.1 miles of views within 0.5 mile ▪ 0.3 mile of views between 0.5 mile and 1.0 mile
Federal Agency Visual Management Objectives (miles crossed)	▪ 3.8 miles of USFS Partial Retention VQO	▪ 3.3 miles of USFS Partial Retention VQO ▪ 0.1 mile of USFS Modification VQO
Environmental Consequences		
Scenery	Moderate impact on Class B scenery	Similar to COUT-A
Residences	No key impacts	No key impacts
Travel routes	High impact on views from White River/Strawberry Road Scenic Backway	Similar to COUT-A
Recreation areas	No key impacts	No key impacts
Special designations	No key impacts	No key impacts
Selective mitigation	3, 4, 5, and 9	3, 4, 5, and 9
Cumulative effects	Colocation with the TransWest Express transmission line would consolidate effects on scenery and on views	Similar to COUT-A
Plan Compliance		
Plan amendment (Yes or No)	No	No

TABLE F-77
CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative COUT-A Link U429 (3.8 miles)	Variation 1 Link U428 (3.4 miles)
Affected environment	▪ Two sites identified by the Class I inventory ▪ No known sites in the Project APE ▪ No key resources, NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components were identified	Same as COUT-A
Environmental consequences (miles crossed)	▪ 0.0 miles of high cultural resource intensity ▪ 0.1 miles of moderate cultural resource intensity ▪ 3.7 miles of low cultural resource intensity	Compared to COUT-A, Variation 1 would include: ▪ 0.0 mile of high cultural resource intensity ▪ 0.3 fewer miles of moderate cultural resource intensity ▪ An additional 0.1 miles of low cultural resource intensity

TABLE F-77
CHIPMAN CREEK – COMPARISON OF ROUTE VARIATIONS FOR CULTURAL RESOURCES

Focus of Comparison	Alternative **COUT-A** **Link U429 (3.8 miles)**	**Variation 1** **Link U428 (3.4 miles)**
Selective mitigation	▪ Specific mitigation measures for historic properties would be developed by the BLM in consultation with the consulting parties to the Programmatic Agreement, American Indian tribes, and the Project Applicant and implemented to mitigate any identified adverse impacts. These may include, but are not limited to, Project modifications and data recovery studies	Same as COUT-A
Cumulative effects	The addition of the Project to past and present actions and RFFAs would result in a greater potential for cumulative effects on historic properties and other potentially significant cultural resources	Same as COUT-A
Plan Compliance		
Plan amendment (Yes or No)	No	No

Appendix G

Supplemental Analysis to Support National Park Service Decision

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LIST OF ACRONYMS

ACEC	Area of Critical Environmental Concern
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
dBA	Decibels (A-weighted)
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
FWS	U.S. Fish and Wildlife Service
GAP	Gap Analysis Project
KOP	Key Observation Point
L levels	A-weighted sound level that is exceeded for a specified percentage of time
L_5 level	Noise level that is exceeded only 5 percent of the time
L_{50} level	Noise level that is exceeded only 50 percent of the time
NEPA	National Environmental Policy Act of 1969
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NHT	National Historic Trails
NPS	National Park Service
NRHP	National Register of Historic Places
OHV	Off-highway vehicle
PFYC	Potential Fossil Yield Classification
POD	Plan of Development
Project	Energy Gateway South Transmission Project
PRPA	Paleontological Resources Protection Act
SLRU	Sensitivity Level Rating Unit
SQRU	Scenic Quality Rating Unit
SWReGAP	Southwest Regional Gap Analysis Project
TCP	Traditional Historic Property
U.S.C.	United States Code
USFS	U.S. Forest Service
USGS	U.S. Geological Survey

VRI	Visual Resource Inventory
VRM	Visual Resource Management

APPENDIX G – SUPPLEMENTAL ANALYSIS TO SUPPORT NATIONAL PARK SERVICE DECISION

G.1 Introduction and Background

In the Chapters 3 and 4, the resource data and results of the impact assessment and mitigation planning process are addressed and disclosed by resource; that is, without specific attention to the various jurisdictions crossed along the routes. In response to a request by the National Park Service (NPS), the results specific to the local routing options, or route variations, along Alternative WYCO-B (refer to Section 2.7.1) that occur across and in the vicinity of the NPS-owned lands at Deerlodge Road (refer to Appendix F, Map F-3) are documented in this appendix. The analysis in this appendix tiers to the broader assessment in Chapters 3 and 4 and the comparison of route variations presented in Appendix F.

The Draft Environmental Impact Statement (EIS) presented two route options in this area. One route option, the route of Alternative WYCO-B (the Agency Preferred Alternative route presented in the Draft EIS), parallels existing 345-kilovolt (kV) and 138kV transmission lines (Links C171, C173, and C174). However, this option crosses the Tuttle Ranch Conservation Easement (designated as such in October 2013) and Cross Mountain Ranch Conservation Easement (designated as such in December 2014), the Agreements which exclude new overhead transmission lines crossing the conservation easement. The other option (Links C94 and C93) crosses the Deerlodge Road entrance to Dinosaur National Monument. Considering the potential for the proposed transmission line to cross Deerlodge Road, most of which is owned in fee by the NPS and part of Dinosaur National Monument and NPS' mandate to identify and analyze viable alternatives in cases where NPS-administered land may be impaired, the NPS requested consideration of an additional route option farther north that would cross a segment of Deerlodge Road in a parcel administered by the State of Colorado (Links C94 and C95). The NPS holds a right-of-way from Utah State Institutional Trust Lands for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit if this route option is selected. This route option is the Agency Preferred Alternative route identified in the Final EIS. Refer to Appendix F, Map F-3.

G.2 National Park Service Purpose and Need for the Federal Action

Because NPS owns the portion of the Deerlodge Road crossed by a local routing option considered for Alternative Route WYCO-B (refer to Section 2.7.1), a right-of-way permit from NPS would be required for PacifiCorp (doing business as Rocky Mountain Power (Applicant) to construct and operation this portion of the transmission line, if this route is selected (NPS Organic Act, 16 United States Code [U.S.C.] 1). Under applicable NPS laws and regulations, a right-of-way is a permit issued by the NPS to a third-party to pass over, under, or through NPS property. A right-of way permit is a discretionary and revocable document and, unlike a deeded easement or fee simple ownership, does not convey or imply any interest in the lands. In addition, a right-of-way permit may only be issued under certain circumstances. According to Section 8.6.4.1 of NPS Management Policies, right-of-way permits usually are only issued pursuant to specific statutory authority, and generally if there is not practical alternative to such use of NPS lands. Moreover, under 16 U.S.C. 1, the NPS is under congressional mandate not to allow any of the NPS land that would impair or degrade the values and purposes for which the park was authorized or be incompatible with the public interest, except when authorized by Congress. Although electric transmission infrastructure through park units are authorized by 16 U.S.C. 79 (Rights-of-way for Public Utilities), their installation, operation, and maintenance activities with their park boundaries are subject to NPS right-of-way regulations described in 36 Code of Federal Regulations (CFR) Part 14. These regulations apply to federally owned or controlled lands administered by the NPS, including the subsurface, which NPS administers for public use purposes. The NPS Management Policies further set out criteria to meet the approval requirements in the regulations (see NPS Management Policies Sections 8.6.4.1, 8.6.4.2, and 8.2), which are compatibility with the public interest, the lack of a practicable alternative location, and no unacceptable impacts on park resources, values, or purposes.

The information in this appendix is intended to supplement the EIS with additional information and more detailed analysis that would be required by the agency to fully consider the Applicant's application for right-of-way across Deerlodge Road, if needed.

G.3 National Park Service Decisions to be Made

If the selected route crosses NPS-owned lands at Deerlodge Road, the Applicant would be required by apply for a right-of-way permit to pass over NPS-owned land. In this case, the decision to be made by the NPS is whether or not to grant a permit for right-of-way across and, if so, under what terms and conditions.

G.4 Study Approach

While tiering to the broader assessment in Chapters 3 and 4 and the comparison of routing options in Appendix F, this appendix presents a more focused analysis to compare the three routing options in this area analyzed in the Final EIS to support NPS in its decision whether or not to grant right-of-way should the route option that crosses NPS-owned lands at Deerlodge Road, should it become the selected route.

The three routing options start on the north side of U.S. Highway 40 and end 6.5 to 7.7 miles to the southwest on the south side of U.S. Highway 40. Refer to Appendix F, Map F-3. Alternative WYCO-B immediately crosses U.S. Highway 40, runs south for 0.8 miles, and then follows an existing transmission line corridor through the Tuttle Ranch Conservation Easement for 3.0 miles and Cross Mountain Ranch Conservation Easement for 1.1 miles. Variation 1 parallels the north side of U.S. Highway 40 for 3.8 miles, crosses Deerlodge Road in an area under NPS jurisdiction, continues north of U.S. Highway 40 for 1.9 miles, crosses U.S. Highway 40, and terminates at an existing transmission line corridor after an additional 0.8 miles. Variation 2 parallels the north side of U.S. Highway 40 for 2 miles, turns west for 2 miles, crosses Deerlodge Road on lands administered by the State of Colorado, then turns south, crosses U.S. Highway 40, and ends at an existing transmission line corridor after 3.7 miles.

Generally, the methodology for comparing and analyzing the local route variations is the same as described in Chapters 3 and 4. However some additional field verification was conducted for vegetation communities (including habitat for sensitive plants), wetlands, and visual resources at the request of the NPS, and is incorporated into the analysis, as appropriate. The reader is referred to Chapters 3 and 4 for the following sections for each resource:

- Introduction and Regulatory Framework
- Issues Identified for Analysis
- Regional Setting
- Study Methodology

G.5 Resources Analyzed

This section describes the affected environment and known and predicted effects of implementing the Energy Gateway South Transmission Project (Project) on resources relevant to the issues and concerns identified during agency and public scoping and during public review of the Draft EIS. The affected environment and effects analysis were assessed for each local routing option in the vicinity of the NPS-owned lands at Deerlodge Road. Mapping of resource inventory and impact levels associated with the three route variations for each resource is presented in Exhibit G1.

Each resource discussion is organized as follows:

- Local Setting
- Affected Environment
- Environmental Consequences
- Summary

The first map, Map G-1, presents construction access levels present in the vicinity of the NPS-owned lands at Deerlodge Road (refer to Section 2.5.1.2 for a description of construction access levels).

G.5.1 Earth Resources

This section identifies the existing soil and mineral resources, and geological hazards along the three route variations, assesses the potential impacts on the resources from implementation of the Project, and the potential for geological hazards to affect the Project. Issues related to earth resources that were identified during scoping are addressed in this section, including:

- Removal or mixing of surface soil horizons
- Loss of soil-stabilizing vegetation
- Compaction of soils
- Conversion of Prime Farmlands
- Restriction of extraction of a mineral resource
- Potential effects of geological hazards (landslides, unstable slopes, floodplains, and faults)

The resource inventory and impact levels associated with the three route variations are presented on Maps G-2 through G-4.

G.5.1.1 Local Setting

The three variations are located north of the Colorado Plateau Physiographic Province within the Yampa Plateau. Locally, the three variations are southeast of the Yampa River in a topographic low called Twelvemile Gulch with Springs Ridge to the south and Cross Mountain to the north.

G.5.1.2 Affected Environment

The three routing options are located in the Colorado Plateau Physiographic Province. Locally, the three routing options are southeast of the Yampa River in a topographic low called Twelvemile Gulch with Springs Ridge to the south and Cross Mountain to the north. The geologic hazards for the three routing options would be similar. The extent of the areas with susceptibility to flooding and landslides would differ. All three options are entirely within an area with low susceptibility to flooding.

Alternative WYCO-B (Links C92, C171, C173, and C174)

This routing option crosses 1.0 miles of moderate susceptibility to landslides. This options crosses 0.2 miles of Prime Farmlands and 0.6 miles of soils with moderate susceptibility to wind and water erosion. This option crosses 2.4 miles of oil and gas leases.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Variation 1 also crosses 0.4 mile of area with moderate susceptibility to landslides. This variation has no impact on Prime Farmlands or on soils with susceptibility to wind and water erosion. There are 2 miles of oil and gas leases crossed by this variation.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 crosses 0.4 mile of area with moderate susceptibility to landslides. This variation crosses 0.6 mile of Prime Farmlands, 0.5 mile of soils with moderate susceptible to wind erosion, and 0.5 mile of soils with high susceptibility to wind erosion. Variation 2 crosses 2.8 miles of oil and gas leases.

G.5.1.3 Environmental Consequences

Alternative WYCO-B (Links C92, C171, C173, and C174)

This routing option could have the greatest potential impact from landslides. This variation would have less impact on Prime Farmlands, and soils susceptible to erosion than Variation 2, the state-parcel crossing, but greater impacts on soils than the NPS-jurisdiction crossing. This variation would have less impact on oil and gas leases than the Variation 2, state-parcel crossing, but more than the NPS-jurisdiction crossing.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Overall impacts on earth resources would be less for Variation 1 than Variation 2, the state-parcel crossing and the route of Alternative WYCO-B.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 would have greater impacts on Prime Farmlands and soils with high susceptibility to wind erosion than the route of Alternative WYCO-B. This variation also would have greater impact on oil and gas leases than the other two routing options.

G.5.1.4 Summary

Impacts from geologic hazards would be similar for all three routing options. There are areas with higher landslide susceptibility near Links C92, C94, and C171. The impacts on soils are similar for all three routing options, with Alternative WYCO-B crossing more farmlands. Impacts on minerals would be similar, but Alternative WYCO-B crosses more mileage of areas designated as a mineral resource.

G.5.2 Paleontological Resources

This section discusses paleontological resources along the three variations and assesses the potential impacts on the resources from implementation of the Proposed Action.

The resource inventory and impact levels associated with the three route variations are presented on Map G-5.

G.5.2.1 Local Setting

The three variations are located north of the Colorado Plateau Physiographic Province within the Yampa Plateau. Locally, the three variations are southeast of the Yampa River in a topographic low called Twelvemile Gulch with Springs Ridge to the south and Cross Mountain to the north.

G.5.2.2 Affected Environment

The three variations cross different extents of the Browns Park Formation and the Mancos Shale. The paleontological resources inventory and residual impacts are presented in Table G-1. The Browns Park Formation has a potential fossil yield classification (PFYC) of 5, and the Mancos Shale has a PFYC of 3. All variations have a low density for fossil localities. The state-parcel crossing crosses the greatest amount of units with a PFYC of 5. The route of Alternative WYCO-B variation crosses the least miles of areas with PFYC of 5.

TABLE G-1
PALEONTOLOGICAL RESOURCES INVENTORY AND RESIDUAL IMPACTS FOR NATIONAL PARK SERVICE ROUTE VARIATIONS (MILES CROSSED)

Route Variation	Potential Fossil Yield Classification		Fossil Locality Density	Residual Impacts
	3	5	Low	Low
Alternative WYCO-B	0.4	6.1	6.5	6.5
National Park Service-jurisdiction crossing (Variation 1)	0.0	6.5	6.5	6.5
State-parcel crossing (Variation 2)	0.7	7.0	7.7	7.7

G.5.2.3 Environmental Consequences

As a design feature of the Proposed Action, areas with very high or moderate (PFYC 5 and 3) would be surveyed prior to construction to support development of the Paleontological Resources Treatment Plan (PRTP), which would be implemented before and/or during construction. The implementation of the PRTP would minimize the potential for impacts on paleontological resources associated with each route variation.

G.5.2.4 Summary

The impacts on paleontological resources for all three routing options are similar. All three cross the Browns Park Formation which has a PFYC of 4. The southern alternative also crosses a small portion of the Mancos Shale, which has a PFYC of 3.

G.5.3 Water Resources

This section describes the existing condition of water resources and analyzes the potential effects on water resources that could result from construction, operation, and maintenance of the Project in the vicinity of the Dinosaur National Monument Deerlodge Road. This analysis tiers to the broader assessment in Section 3.2.4. Issues related to water resources were identified during the scoping process and include (1) how the Project would affect water quality and (2) what short- and long-term impacts on water resources would be expected from implementation of the Project. Specific issues considered for analyses are presented in Section 3.2.4.

The resource inventory and impact levels associated with the three routing options are presented on Map G-6 at the end of this appendix.

G.5.3.1 Local Setting

The three routing options addressed in this document are located in the Colorado Plateau Ecoregion, as adapted from *North American Terrestrial Ecoregions—Level III* (Commission for Environmental Cooperation 2011) and the Twelvemile Gulch catchment basin, which flows into the Yampa River as part of the Lower Yampa Subbasin near Cross Mountain (refer to MV-6). Water resources in the study corridors for the route variations addressed in this document are limited. There are two named drainages crossed by the three routing options: (1) Twelvemile Gulch, an intermittent stream that supports wetland vegetation in some areas and (2) Mud Springs Gulch, an intermittent drainage which is a tributary to Twelvemile Gulch. Primarily, aquatic habitat in Twelvemile Gulch is classified North American arid west emergent marsh. The dominant terrestrial habitat adjacent to aquatic habitats consists of Intermountain Sagebrush Shrubland and Steppe. Refer to Appendix J for detailed descriptions of land-cover categories.

G.5.3.2 Affected Environment

Due to the arid characteristics of the region, water resources in the analysis area are limited to intermittent streams, stock ponds, and palustrine emergent wetlands. Water resources directly and indirectly crossed by the three routing options are listed in Table G-2. Direct crossings are water resources directly crossed be the routing option centerline. Indirect crossings are water resources located within 328 feet (100 meters) of the route centerline but are not directly crossed.

TABLE G-2
ROUTE VARIATION COMPARISON FOR WATER RESOURCES

Route Variation	Number and Type of Crossings					
	Intermittent Stream		Lake, Reservoir, Pond		Palustrine Emergent Wetlands	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Alternative WYCO-B	9	1	0	0	0	3
National Park Service-jurisdiction crossing (Variation 1)	12	7	0	3	1	3
State-parcel crossing (Variation 2)	13	3	0	0	1	0

Alternative WYCO-B (Links C92, C171, C173, and C174)

Alternative WYCO-B is located south of U.S. Highway 40 and colocated with an existing 345kV transmission line. The variation would cross through the Tuttle Ranch Conservation Easement and Cross Mountain Conservation Easement. The route variation would make a total of nine crossings of intermittent streams including:

- Three crossings of unnamed tributaries to Mud Springs Gulch in an area with no visible riparian habitats and
- Four crossings of unnamed tributaries to Twelvemile Gulch.

Wetland habitats crossed near Alternative WYCO-B are classified as North American arid west emergent marsh. These potential wetlands are located on private property and were not able to be visited during the field visit. Based on an interpretation of aerial photography in the area, the wetlands crossed appear to be relatively isolated. No perennial water resources would be crossed on NPS-administered lands.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Variation 1 is located north of U.S. Highway 40 and crossed Deerlodge Road in an area under NPS jurisdiction. Water resources located along this route variation largely comprise intermittent tributaries of Twelvemile Gulch and Mud Springs Wash, which are intermittent tributaries of the Yampa River. Three stock ponds are indirectly crossed and a spring with a short outflow is directly crossed by the southernmost end of Link C93.

The water-resource crossings listed in Table G-2 for Variation 1 include:

- One crossing of Mud Springs Gulch in an area with no visible aquatic or riparian habitats;
- One crossing of an unnamed tributary to Mud Springs Gulch in an area with no visible aquatic or riparian habitats;
- One crossing of Twelvemile Gulch in a location with no visible aquatic or riparian habitats; and
- Two crossings of an unnamed tributary to Twelvemile Gulch with small areas of visible wetland vegetation.

Additionally, Variation 1 is parallel to and located within 500 feet of the unnamed tributary to Twelvemile Gulch for approximately 0.5 mile. The unnamed tributary appears to support wetland vegetation in this area. Wetland habitats crossed by Variation 1 are classified as North American arid west emergent marsh. These potential wetlands are located on private property and were not accessible to be visited during the field visit.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and would cross the Deerlodge Road on lands administered by the State of Colorado. Variation 2 makes a total of 13 crossings of intermittent streams including but not limited to:

- One crossing of Mud Springs Gulch in an area with no visible riparian habitats;
- One crossing of an unnamed tributary to Mud Springs Gulch in an area with no visible riparian habitats;
- One crossing of Twelvemile Gulch in a location with small areas of visible wetland vegetation; and
- Two crossings of unnamed tributaries to Twelvemile Gulch with no visible riparian habitats.

Wetland habitats crossed by Variation 2 are classified as North American arid west emergent marsh. These potential wetlands are located on lands administered by the State of Colorado and were visited during the field visit (refer to Section G.5.4).

G.5.3.3 Environmental Consequences

The types of potential effects on water resources that could occur under all routing options and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.4. Estimated residual impacts on water resources for the route variations addressed in this document after the application of selective mitigation measures are presented in Table G-3.

TABLE G-3
RESIDUAL IMPACTS FOR WATER RESOURCES (MILES CROSSED)

Route Variation	Total Miles	Intermittent Stream		Lake, Reservoir, Pond		Palustrine Emergent Wetlands		Residual Impacts	
		None	Low	None	Low	None	Low	None	Low
Alternative WYCO-B	6.5	5.0	1.5	6.5	–	6.1	0.4	4.8	1.7
National Park Service-jurisdiction crossing (Variation 1)	6.5	3.9	2.6	6.2	0.3	5.9	0.6	3.9	2.6
State-parcel crossing (Variation 2)	7.7	4.9	2.8	7.7	–	7.6	0.1	4.9	2.8

Alternative WYCO-B (Links C92, C171, C173, and C174)

The anticipated residual impacts on water resources associated with this routing option would be less than those impacts associated with Variation 1 and Variation 2. However, the route of Alternative WYCO-B could result in greater impacts on palustrine emergent wetlands than Variation 1 and Variation 2 (Table G-3).

After application of selective mitigation measures, it is anticipated that all wetlands and springs could be avoided by Project activities such as cut and fill. The types of potential effects on water resources that could occur under all Project alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.4. Alternative WYCO-B would require crossing intermittent or ephemeral drainages. Potential effects on these resources and measures that could be used to reduce these impacts are described in detail in Section 3.2.4. After application of mitigation measures, it is anticipated that wetlands could be avoided and residual impacts associated with the crossing intermittent streams would not result in any residual impacts. Additionally, Alternative WYCO-B is colocated with an existing power line so impacts would occur in areas of previous disturbance. Water resources would not be anticipated to be directly affected on lands administered by the NPS.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

The anticipated residual impacts on water resources associated with Variation 1 would be greater than those impacts associated with the route of Alternative WYCO-B and would be similar to the impacts associated with Variation 2 (Table G-3).

After application of selective mitigation measures, it is anticipated that all wetlands and springs could be avoided by Project activities such as cut and fill. Intermittent streams crossed by the Project would be avoided by transmission line tower placement but may be crossed by access roads. Potential effects on these resources and measures that could be used to reduce these impacts are described in detail in Section 3.2.4. After application of mitigation measures, it is anticipated that impacts associated with crossing intermittent streams would not result in any residual impacts. Variation 1 indirectly crosses three stock ponds which account for 0.3 mile of residual impacts. Actual disturbance to these ponds would likely be avoided and due to the low resource value of stock ponds, impacts could be easily mitigated. Variation 1 is parallel to U.S. Highway 40 and residential developments along the highway; thus, impacts associated with this variation would occur in more previously disturbed areas than the Variation 2. However, this variation would result in of the most potential indirect impacts on palustrine emergent wetlands of the three routing options and would directly cross a spring at the southernmost end of Link C93. Water resources would not be anticipated to be directly affected on lands administered by the NPS.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

The anticipated residual impacts on water resources associated with Variation 2 would be greater than those impacts associated with Alternative WYCO-B and would be similar to the impacts associated with Variation 1 (Table G-3).

After application of selective mitigation measures, it is anticipated that all wetlands and springs could be avoided by Project activities such as cut and fill. Intermittent streams crossed by the Project would be avoided by transmission line tower placement but may be crossed by access roads. Potential effects on these resources and measures that could be used to reduce these impacts are described in detail in Section 3.2.4. After application of mitigation measures, it is anticipated that impacts associated with crossing intermittent streams would not result in any residual impacts. Variation 2 is located in a less developed area than Variation 1 and the route of Alternative WYCO-B, so impacts associated with this routing option would occur in areas with less existing disturbance. Water resources would not be anticipated to be directly affected on lands administered by the NPS.

G.5.3.4 Summary

All of the routing options would affect similar water resources in the Twelvemile Gulch and would have similar effects. After application of selective mitigation measures, it is anticipated that the most sensitive water resources crossed (i.e., palustrine emergent wetlands and springs) could be avoided by activities such as cut and fill by all three routing options. However, intermittent streams could be crossed by new or improved access routes required by any of the routing options.

Alternative WYCO-B would have the least overall impacts on water resources, would be colocated with existing high-voltage transmission line infrastructure and would be located the furthest from the Yampa River, the area’s major perennial water body. Variation 1 and Variation 2 would have similar overall residual impacts on water resources. However, Variation 1 would affect more palustrine emergent wetlands than Variation 2.

G.5.4 Vegetation

This section describes the existing condition of vegetation resources and analyzes the potential effects on vegetation resources that could result from construction, operation, and maintenance of the Project in the vicinity of the Dinosaur National Monument Deerlodge Road. This analysis tiers to the broader assessment in Section 3.2.5.

The resource inventory and impact levels associated with the three routing options are presented on Map G-7 at the end of this appendix.

G.5.4.1 Local Setting

The three routing options addressed in this document are located in the Colorado Plateau Ecoregion, as adapted from *North American Terrestrial Ecoregions—Level III* (Commission for Environmental Cooperation 2011) and the Twelvemile Gulch catchment basin, which flows into the Yampa River as part of the Lower Yampa Subbasin near Cross Mountain (refer to Section 3.2.5). A total of 86 Gap Analysis Project (GAP) land-cover categories occur in the Project area (U.S. Geological Survey [USGS] 2010b). For the purposes of the EIS analysis, the 86 GAP land-cover categories were consolidated and reclassified into 16 primary vegetation communities based on similarities in species composition, vegetative structure, and topographic positioning. Each vegetation community is described in Section 3.2.5 (full descriptions of land-cover categories in each primary vegetation community can be found in Appendix J, Table J-1). Of the 16 primary vegetation communities, 7 are present variation route study area: agriculture, big sagebrush, developed, grassland, pinyon-juniper, shrub shrub/steppe, and small areas of wetland. Habitats crossed by the route variations are primarily dominated by big sagebrush vegetation community composed of Inter-Mountain Basin big sagebrush shrubland and Inter-Mountain Basin big sagebrush steppe land-cover categories. Pinyon-juniper vegetation communities consisting of the Inter-Mountain Basin Juniper Savanna land-cover category are the next most prevalent vegetation community and are located on adjacent hillslopes. In addition, wetland vegetation communities composed of the North American arid west emergent marsh land-cover category are interspersed along the bottom of Twelvemile Gulch.

The resource inventory and impact levels associated with the three routing options are presented on Map G-7.

G.5.4.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B is located south of U.S. Highway 40, and colocated with an existing 345kV transmission line. The route of Alternative WYCO-B crosses through the Tuttle Ranch Conservation Easement. Five primary vegetation communities are crossed by the route of Alternative WYCO-B: big sagebrush, developed, grassland, pinyon-juniper, and shrub/shrub steppe (Table G-4). Sparse wetland vegetation is located along Twelvemile Gulch within the geographic scope of analysis. Vegetation communities on lands under NPS jurisdiction would not be crossed by Alternative WYCO-B.

Observations made during the field visit noted the following plant species were components of the vegetation visible from U.S. Highway 40:

- Dominant overstory of *Artemisia tridentata* and
- Dominant non-native grass understory of *Agropyron cristatum* and *Bromus tectorum*; not highly disturbed, though identified as “Developed/Disturbed” in GAP mapping.

TABLE G-4
ROUTE AREA COMPARISON FOR PRIMARY VEGETATION COMMUNITIES

Route Variation	Total Miles	Primary Vegetation Communities (miles crossed)[1]					
		Agriculture	Big Sagebrush	Developed/Disturbed	Grassland	Pinyon-Juniper	Shrub/Shrub Steppe
Alternative WYCO-B	6.5	0.0	4.9	0.4	0.5	0.6	0.1
BLM-administered land	*2.1*	*0.0*	*1.4*	*0.4*	*0.1*	*0.2*	*0.0*
Private land	*4.4*	*0.0*	*3.5*	*0.0*	*0.4*	*0.4*	*0.1*
NPS-jurisdiction crossing (Variation 1)	6.5	0.1	4.9	0.5	0.2	0.8	0.0
NPS-administered land	0.1	0.0	0.1	0.0	0.0	0.0	0.0
BLM-administered land	*0.2*	*0.0*	*0.0*	*0.1*	*0.1*	*0.0*	*0.0*
Private land	*6.2*	*0.1*	*4.8*	*0.4*	*0.1*	*0.8*	*0.0*

TABLE G-4
ROUTE AREA COMPARISON FOR PRIMARY VEGETATION COMMUNITIES

Route Variation	Total Miles	Primary Vegetation Communities (miles crossed)[1]					
		Agriculture	Big Sagebrush	Developed/Disturbed	Grassland	Pinyon-Juniper	Shrub/Shrub Steppe
State-parcel crossing (Variation 2)	7.7	0.2	5.5	0.3	0.0	1.6	0.1
BLM-administered land	*1.7*	*0.0*	*0.6*	*0.2*	*0.0*	*0.9*	*0.0*
State-administered land	*1.0*	*0.0*	*0.7*	*0.0*	*0.0*	*0.2*	*0.1*
Private land	*5.0*	*0.2*	*4.2*	*0.1*	*0.0*	*0.5*	*0.0*

NOTES:
[1] Minor wetland communities were noted in the field visit, but are too small to be detected using the impact assessment methodology.
BLM = Bureau of Land Management
NPS = National Park Service

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located north of U.S. Highway 40 and crosses the Deerlodge Road in an area under NPS jurisdiction. Five primary vegetation communities are crossed by Variation 1: agriculture, big sagebrush, developed, grassland, and pinyon-juniper (Table G-4). Vegetation communities crossed by Variation 1 are mostly big sagebrush vegetation communities with sparse juniper cover. In addition, evidence of historic patchy wildfire was observed during the field visit. Sparse wetland vegetation is located along Twelvemile Gulch within the geographic scope of analysis. Vegetation communities on lands under NPS jurisdiction would be spanned, as Deerlodge Road is the only area under NPS jurisdiction that would be crossed by the Project.

Observations made during the field visit noted the following plant species were components of the vegetation visible from Deerlodge Road, U.S. Highway 40, and other accessible areas crossed by the route:

- Dominant overstory of *Artemisia tridentata* with sparse distribution of *Chrysothamnus viscidiflorus* and *Ericameria nauseosa*;
- Dominant grass understory of *Agropyron cristatum* with sparse distribution of *Sporobolos sp.*, *Hesperostipa comata*, and *Agrostis sp.*;
- Sparse forb distribution consisting of *Medicago sativa*, *Opuntia sp.*, *Sphaeralcea sp.*, and *Phlox sp.*; and
- Areas without sagebrush cover are dominated by *Agropyron cristatum*, likely seeded post-fire.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and crosses the Deerlodge Road on lands administered by the State of Colorado. Five primary vegetation communities are crossed by Variation 2: agriculture, big sagebrush, developed, pinyon-juniper, and shrub/shrub steppe (Table G-4). Vegetation communities crossed by Variation 2 are mostly big sagebrush vegetation communities with pinyon-juniper vegetation communities on northeastern aspects. Wetland vegetation is located along Twelvemile Gulch within the geographic scope of analysis. Evidence of a historic wildfire was observed on the west side of Deerlodge Road during the field visit, but sagebrush cover is generally more consistent than in Variation 1. Vegetation communities on lands under NPS jurisdiction would not be crossed by Variation 2.

Observations made during the field visit noted the following plant species were components of the vegetation visible from Deerlodge Road, U.S. Highway 40, and other accessible areas crossed by the route:

- Dominant overstory of *Juniperus osteosperma* and *Artemisia tridentata* with sparse distribution of *Atriplex canescens*;
- Dominant grass understory of *Agropyron cristatum*; higher cover of native grasses than Variation 1, including *Koeleria macrantha*, *Achnatherum hymenoides*, *Sporobolos sp.*, *Hesperostipa comata*, and *Agrostis sp*.;
- Greater diversity and cover or forb species than Variation 1, including *Eriogonum sp*., *Cirsium sp*., *Astragalus sp*., *Antennaria sp*., and *Phlox sp*.; and
- Wetland vegetation community mainly Graminoid-dominated with *Leymus cinereus*, *Agropyron cristatum*, *Distichlis spicata*, and *Juncus balticus*. Forbs include *Glycyrrhiza lepidota*, *Iva axillaris*, *Cirsium sp.*, and sparse distribution of young *Salix exigua*.

G.5.4.3 Environmental Consequences

The estimated levels of residual impacts on vegetation communities are shown in Table G-5.

TABLE G-5
ROUTE VARIATION COMPARISON FOR RESIDUAL IMPACTS ON VEGETATION COMMUNITIES

Route Variation	Total Miles	Primary Vegetation Communities (miles crossed)			
		Low	Low-Moderate	Moderate	Moderate-High
Alternative WYCO-B	6.5	0.4	0.7	5.4	0.0
BLM-administered land	*2.1*	*0.4*	*0.2*	*1.5*	*0.0*
Private land	*4.4*	*0.0*	*0.5*	*3.9*	*0.0*
NPS-jurisdiction crossing (Variation 1)	6.5	0.6	0.8	5.1	0.0
NPS-administered land	*0.1*	*0.0*	*0.0*	*0.1*	*0.0*
BLM-administered land	*0.2*	*0.1*	*0.0*	*0.1*	*0.0*
Private land	*6.2*	*0.5*	*0.8*	*4.9*	*0.0*
State-parcel crossing (Variation 2)	7.7	0.5	1.7	5.5	0.0
BLM-administered land	*1.7*	*0.2*	*0.9*	*0.6*	*0.0*
State-administered land	*1.0*	*0.0*	*0.3*	*0.7*	*0.0*
Private land	*5.0*	*0.3*	*0.5*	*4.2*	*0.0*

NOTES:
BLM = Bureau of Land Management
NPS = National Park Service

Alternative WYCO-B (Links C92, C171, C173, and C174)

Based on the impact-assessment criteria developed for the EIS, the impacts associated with the route of Alternative WYCO-B would be primarily moderate. Moderate impacts are associated with the predominance of big sagebrush and grassland communities. There are no moderate-high impacts anticipated. The route of Alternative WYCO-B would result in permanent loss of vegetative cover due to access-road and transmission-line construction (Table G-5). These losses would occur predominantly in big sagebrush vegetation communities, with smaller areas of loss in developed/disturbed, grassland, pinyon-juniper, and shrub/shrub steppe vegetation communities (Table G-6). Ground disturbance in vegetation communities associated with the route of Alternative WYCO-B would not occur on lands administered by the NPS. Alternative WYCO-B does not cross any areas under NPS jurisdiction.

The types of potential effects on vegetation habitats that could occur and the degree to which these effects would be mitigated or avoided are described in Section 3.2.5.

TABLE G-6
ROUTE AREA COMPARISON FOR PRIMARY VEGETATION COMMUNITIES (IN ACRES)

Route Variation	**Total Ground Disturbance (acres)**	**Estimated Disturbance of Primary Vegetation [1]**					
		Agriculture	**Big Sagebrush**	**Developed/ Disturbed**	**Grassland**	**Pinyon-Juniper**	**Shrub/Shrub Steppe**
Alternative WYCO-B	99	0	75	6	8	9	2
BLM-administered land	*32*	*0*	*21*	*6*	*2*	*3*	*0*
Private land	*67*	*0*	*53*	*0*	*6*	*6*	*2*
NPS-jurisdiction crossing (Variation 1)	94	1	71	7	3	12	0
NPS-administered land[2]	–	–	–	–	–	–	–
BLM-administered land	*3*	*0*	*0*	*1*	*1*	12	*0*
Private land	*89*	*1*	*69*	*6*	*1*	0	*0*
State-parcel crossing (Variation 2)	119	3	85	5	0	25	2
BLM-administered land	*26*	*0*	*9*	*3*	*0*	14	*0*
State-administered land	*15*	*0*	*11*	*0*	*0*	3	*2*
Private land	*77*	*3*	*65*	*2*	*0*	8	*0*

NOTES:
[1] Minor wetlands were noted in the field visit, but are too small to be detected using the impact assessment methodology.
[2] No ground disturbance in vegetation communities on NPS-administered lands would occur as all lands under NPS-jurisdiction would be spanned by the Project.
BLM = Bureau of Land Management
NPS = National Park Service

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Based on the impact assessment criteria developed for the EIS, the impacts associated with Variation 1 would be primarily moderate. Moderate impacts are associated with the predominance of big sagebrush and grassland communities. There are no moderate-high impacts anticipated. Variation 1 would result in permanent loss of vegetative cover due to access road and transmission line construction (Table G-5). These losses would occur predominantly in big sagebrush and pinyon-juniper vegetation communities, with smaller areas of loss in agriculture, developed/disturbed, and grassland vegetation communities (Table G-6). Ground disturbance in vegetation communities associated with Variation 1 would not occur on lands administered by the NPS. Variation 1 would span the area of Deerlodge Road under NPS jurisdiction.

The types of potential effects on vegetation habitats that could occur and the degree to which these effects would be mitigated or avoided are described in Section 3.2.5.4.3. In addition to adherence with regulatory statutes as described in Section 3.2.5.1.1, invasive plant prevention guidelines as described in the Dinosaur National Monument Invasive Plant Management Plan and Environmental Assessment, Appendix D, would be followed during construction, operation, and maintenance of the Project on NPS administered lands (NPS 2005).

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Based on the impact assessment criteria developed for the EIS, the impacts associated with Variation 2 would be primarily moderate. Moderate impacts are associated with the predominance of big sagebrush and grassland communities. There are no moderate-high impacts anticipated. Variation 2 would result in permanent loss of vegetative cover due to access road and transmission line construction (Table G-5). These losses would occur predominantly in big sagebrush and pinyon-juniper vegetation communities, with smaller areas of loss in agriculture, developed/disturbed, and shrub/shrub steppe vegetation communities (Table G-6). Ground disturbance in vegetation communities associated with Variation 2 would not occur on lands administered by the NPS. Variation 2 does not cross any areas under NPS jurisdiction.

The types of potential effects on vegetation habitats that could occur and the degree to which these effects would be mitigated or avoided are described in Section 3.2.5.

G.5.4.4 Summary

All of the routing options cross similar amounts and types of vegetation communities and would have similar types of impacts. Additionally, potential impacts on vegetation communities could be reduced through implementation of Project design features for environmental protection (Table 2-8) and selective mitigation measures (Table 2-13) for all route variations.

Land uses and management practices on lands surrounding the route variations have altered the composition of the vegetation communities and introduced non-native species to different degrees in vegetation communities crossed.

G.5.5 Special Status Plants

This section describes the existing condition of special status plants and analyzes the potential effects on these resources that could result from construction, operation, and maintenance of the Project in the vicinity of the Dinosaur National Monument Deerlodge Road. This analysis tiers to the broader assessment in Section 3.2.6. Special status plant species are those federally listed as either endangered, threatened, or candidates for protection under the Endangered Species Act of 1973 (ESA) or those considered sensitive by the Bureau of Land Management (BLM) and/or state. The NPS Dinosaur National Monument does not maintain an agency-specific list of special status plants, but considers species managed by U.S. Fish and Wildlife Service (FWS), BLM, and the State of Colorado in the decision making process.

G.5.5.1 Local Setting

The three route variations addressed in this document are located in the Colorado Plateau Ecoregion, as adapted from *North American Terrestrial Ecoregions—Level III* (Commission for Environmental Cooperation 2011) and the Twelvemile Gulch catchment basin which flows into the Yampa River as part of the Lower Yampa Subbasin near Cross Mountain (refer to Section 3.2.5). A total of 86 National Land Cover GAP land-cover categories identified by the GAP dataset occur in the Project area (USGS 2010b). For the purposes of the EIS analysis, the 86 GAP land-cover categories were consolidated and reclassified into 16 primary vegetation communities based on similarities in species composition, vegetative structure, and topographic positioning. Each vegetation community is described in Section 3.2.5 (full descriptions of land-cover categories in each primary vegetation community can be found in Appendix J, Table J-1).

Of the 16 primary vegetation communities, 7 are present variation route study area: agriculture, big sagebrush, developed, grassland, pinyon-juniper, shrub shrub/steppe, and small areas of wetland. Habitats crossed by the route variations are primarily dominated by big sagebrush vegetation community composed of Inter-Mountain Basin big sagebrush shrubland and Inter-Mountain Basin big sagebrush steppe land-cover categories. Pinyon-juniper vegetation communities consisting of the Inter-Mountain Basin Juniper Savanna land-cover category are the next most prevalent vegetation community and are located on adjacent hillslopes. In addition, wetland vegetation communities composed of the North American arid west emergent marsh land-cover category are interspersed along the bottom of Twelvemile Gulch.

A total of 61 special status plant species have the potential to occur in the study corridors analyzed in the EIS (Table 3-66). Of the 61 plant species analyzed only one BLM-sensitive plant species, caespitose cat's-eye (*Cryptantha caespitosa*), is known to occur within 1 mile of the routing options addressed in this document. Caespitose cat's-eye occurs on sparsely vegetated shale knolls at 6,200 to 8,100 feet. Habitat includes pinyon-juniper or sagebrush and is typically found with other cushion plants (Colorado Natural Heritage Program [CNHP] 1997). There are no known occurrences of any ESA-listed plant species in the vicinity of the route variations addressed in this document. Appendix J includes detailed species descriptions, life history, and occurrence information for all species analyzed.

The resource inventory and impact levels associated with the three routing options are presented on Map G-7.

G.5.5.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

Alternative WYCO-B is located south of U.S. Highway 40, and colocated with an existing 345kV transmission line. The route of Alternative WYCO-B crosses through the Tuttle Ranch Conservation Easement. The dominant terrestrial habitat crossed by the route of Alternative WYCO-B consists of Intermountain Sagebrush Shrubland and Steppe. Inter-Mountain Basin Juniper Savanna is located on adjacent hillslopes. BLM-sensitive caespitose cat's-eye (*Cryptantha caespitosa*) is known to occur within 1 mile of the routing option study area. Occurrence data for the species is derived from field surveys conducted in 1983 as archived by the CNHP. Information regarding specific locations or number of individuals that occur in association with the route variation is not available. However, the relative likelihood of suitable habitat for this species to be crossed by the route is restrained, as big sagebrush and pinyon-juniper vegetation communities associated with sparsely vegetated shale knolls occur irregularly throughout the area. Caespitose cat's-eye is the only special status plant species that is known to occur or is likely to occur in association with the route of Alternative WYCO-B. Observations made during the field visit did not note presence of the species; however, vegetation communities known to provide suitable habitat for the species were observed in association with the route variation (refer to Section G.5.4).

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located north of U.S. Highway 40 and crosses the Deerlodge Road in an area under NPS jurisdiction. The dominant terrestrial habitat crossed by Variation 1 consists of Intermountain Sagebrush Shrubland and Steppe. Inter-Mountain Basin Juniper Savanna is located on adjacent hillslopes. BLM-sensitive caespitose cat's-eye (*Cryptantha caespitosa*) is known to occur within 1 mile of the routing option study area. Occurrence data for the species is derived from field surveys conducted in 1983 as archived by the CNHP. Information regarding specific locations or number of individuals that occur in association with Variation 1 is not available. However, the relative likelihood of suitable habitat for this species to be crossed by the route is restrained, as big sagebrush and pinyon-juniper vegetation communities associated with sparsely vegetated shale knolls occur irregularly throughout the area. Caespitose cat's-eye is the only special status plant species that is known to occur or is likely to occur in association with Variation 1. Observations made during the field visit did not note presence of the species; however, vegetation communities known to provide suitable habitat for the species were observed in association with Variation 1 (refer to Section G.5.4).

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and crosses the Deerlodge Road on lands administered by the State of Colorado. The dominant terrestrial habitat crossed by Variation 2 consists of Inter-Mountain Basin Juniper Savanna. Intermountain Sagebrush Shrubland and Steppe also is prevalent. BLM-sensitive caespitose cat's-eye (*Cryptantha caespitosa*) is known to occur within 1-mile of the Variation 2 study area. Occurrence data for the species is derived from field surveys conducted in 1983 as archived by the CNHP. Information regarding specific locations or number of individuals that occur in association with the route variation is not available. However, the relative likelihood of suitable habitat for this species crossed by the route is restrained, as big sagebrush and pinyon juniper vegetation communities associated with sparsely vegetated shale knolls occur irregularly throughout the area. Caespitose cat's-eye is the only special status plant species that is known to occur or is likely to occur in association with Variation 2. Observations made during the field visit did not note presence of the species; however, vegetation communities known to provide suitable habitat for the species were observed in association with Variation 2 (refer to Vegetation Section G.5.4).

G.5.5.3 Environmental Consequences

Alternative WYCO-B (Links C92, C171, C173, and C174)

The types of potential effects on special status plants that could occur under all Project-wide alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.6. The methodology used to assess potential impacts on special status plant resources for the purpose of interdisciplinary comparison of alternative routes in the EIS did not identify any potential impacts on special status plants located near the Alternative WYCO-B study corridor. BLM-sensitive caespitose cat's-eye (*Cryptantha caespitosa*) is known to occur within 1-mile of the routing option study area. The relative likelihood of suitable habitat for this species to be crossed by the route is restrained, as big sagebrush and pinyon-juniper vegetation communities associated with sparsely vegetated shale knolls occur irregularly throughout the area. However, preconstruction surveys for sensitive species would occur in order to identify the presence of special status plants and an appropriate combination of Project design features and selective mitigation measures would be implemented in order to minimize or avoid impacts on the species where identified (refer to Section 3.2.6). After application of mitigation measures, it is not anticipated that individual special status plants would be directly affected by Project activities.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

The types of potential effects on special status plants that could occur under all Project-wide alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.6. The methodology used to assess potential impacts on special status plant resources for the purpose of interdisciplinary comparison of alternative routes in the EIS did not identify any potential impacts on special status plants located near the Variation 1 study corridor.

BLM-sensitive caespitose cat's-eye (*Cryptantha caespitosa*) is known to occur within 1 mile of Variation 1 study area. The relative likelihood of suitable habitat for this species crossed by the route is restrained, as big sagebrush and pinyon-juniper vegetation communities associated with sparsely vegetated shale knolls occur irregularly throughout the area. However, preconstruction surveys for sensitive species would occur in order to identify the presence of special status plants and an appropriate combination of Project design features and selective mitigation measures would be implemented in order to minimize or avoid impacts on the species where identified (refer to Section 3.2.6). After application of mitigation measures, it is not anticipated that individual special status plants would be directly affected by Project activities. In addition to adherence with regulatory statutes as described in Section 3.2.6, invasive plant prevention guidelines as described in the Dinosaur National Monument Invasive Plant Management Plan and Environmental Assessment, Appendix D, would be followed during construction, operation, and maintenance of the Project on NPS-administered lands (NPS 2005).

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

The types of potential effects on special status plants that could occur under all Project-wide alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.6. The methodology used to assess potential impacts on special status plant resources for the purpose of interdisciplinary comparison of alternative routes in the EIS did not identify any potential impacts on special status plants located near the Variation 2 study corridor.

BLM-sensitive caespitose cat's-eye (*Cryptantha caespitosa*) is known to occur within 1 mile of the Variation 2 study area. The relative likelihood of suitable habitat for this species crossed by the route is restrained, as big sagebrush and pinyon-juniper vegetation communities associated with sparsely vegetated shale knolls occur irregularly throughout the area. However, preconstruction surveys for sensitive species would occur in order to identify the presence of special status plants and an appropriate combination of Project design features and selective mitigation measures would be implemented in order to minimize or avoid impacts on the species where identified (refer to Section 3.2.6.4.3). After application of mitigation measures, it is not anticipated that individual special status plants would be directly affected by Project activities.

G.5.5.4 Summary

The dominant terrestrial habitat crossed by all three routing options consists of Intermountain Sagebrush Shrubland and Steppe with Inter-Mountain Basin Juniper Savanna located on adjacent hillslopes. BLM-sensitive caespitose cat's-eye (*Cryptantha caespitosa*) is known to occur within 1-mile of all three routing options. However, the methodology used to assess potential impacts on special status plant resources for the purpose of interdisciplinary comparison of alternative routes in the EIS did not identify any potential impacts on special status plants located near the three routing options. There are no known occurrences of any other special status species. For all route variations, potential impacts on sensitive plants could be reduced or avoided through implementation of Project design features for environmental protection (Table 2-8) and selective mitigation measures (Table 2-13). After application of mitigation measures, it is not anticipated that individual special status plants would be directly affected by Project activities for any of the route variations.

G.5.6 Wildlife

This section describes the existing condition of wildlife resources and analyzes the potential effects on wildlife resources that could result from construction, operation, and maintenance of the Project in the vicinity of the Dinosaur National Monument Deerlodge Road. Wildlife resources discussed in this section include all wildlife species that are not designated as threatened, endangered, or candidates for listing under the ESA; species not listed as sensitive by the U.S. Forest Service (USFS) or BLM; and species not listed as threatened, endangered, or of special concern by the State of Colorado. Analysis of potential effects on special status wildlife species is contained in Section G.5.7; analysis of potential effects on fish and aquatic resources is contained in Section G.5.7. This analysis tiers to the broader assessment in Section 3.2.7.

Direct effects (those that take place at the same time or in the same location as the Proposed Action) of the Project on wildlife species analyzed could include loss of habitat resulting from ground-disturbing activities, mortality during construction or operation of the Project, disturbance from human presence or construction noise, habitat fragmentation, and dust deposition. Effects such as mortality were considered to be limited to areas where ground disturbance would be proposed or where existing access roads would be used by Project vehicles.

The extent of habitat loss that may occur as a result of construction, operation, and maintenance of the Project was estimated using the best available information from the Applicant to provide an estimate of the extent of potential impacts on wildlife species. Prior to final engineering design of the Project, the location of Project features such as new access roads, upgrades to existing roads, drive-and-crush areas, transmission line structures, and other Project facilities have not been identified. The analysis was completed by estimating the total disturbance in acres due to construction of features such as the Project access network (construction of new roads, upgrades to existing roads, drive-and-crush travel), transmission line structures, and other Project facilities over the entire length of the Alternative WYCO-B. The analysis assumes a constant rate of disturbance per mile of transmission line, which was calculated using the estimated total disturbance and the total length of the transmission line. The rate was then used to estimate the extent of loss of habitat (in acres) that would occur with each specific length of habitat crossed by each routing options. Habitat loss estimates include both permanent and temporary disturbances; therefore representing an overestimate of permanent ground disturbance. Permanent disturbance includes structure-pad areas, communication-regeneration stations, substations and series-compensation stations, and permanent access roads. Temporary disturbance includes structure work areas, wire tensioning/pulling sites, wire splicing sites, multipurpose construction yards, helicopter fly yards, guard structures, and temporary access roads. All areas subject to temporary disturbance would be revegetated in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the Plan of Development (POD).

Noise and associated impacts on wildlife were analyzed based on available information regarding noise transmission and the response of wildlife species. Noise effects would be greatest during the construction phases of the Project. Heavy machinery would be used during the construction phases for access road improvement and construction, construction site preparation, excavation and potential blasting, drilling of concrete piers, and cleanup and site reclamation. Data for the specific level and duration at which noise results in adverse effects on wildlife were not available for most wildlife species. Noise management strategies to reduce disturbance to birds often limit new noise levels to 10 decibels (A-weighted) (dBA) above ambient levels (Nicholoff 2003, Wyoming Executive Order 2011-5). Due to the lack of available information regarding noise thresholds for other wildlife species, this analysis assumes that an increase of 10 dBA over the existing noise floor would potentially result in an adverse effect to all wildlife species that may be present in the Project area. Although detailed construction-noise modeling has not been conducted for this Project, an assumed noise level of 85 dBA from construction activities requiring heavy equipment was used to support a noise analysis in a similar example (BLM and Western Area Power Administration 2014). At 85 dBA, construction activities requiring heavy equipment are anticipated to result in an increased noise floor of more than 10 dBA in areas within of 1 mile of construction activities. Therefore, for this analysis it was assumed that the potential effects of noise on wildlife could occur in any location within 1 mile of the transmission line route. Operation of the transmission line is not anticipated to result in noise levels that would adversely affect wildlife species; therefore, noise associated with operation of the transmission line is not included in this analysis.

Indirect effects (those that take place at a later in time or in a different location than the Proposed Action) of the Project on wildlife species analyzed could include vegetation changes such as altered fire regimes or facilitation colonization by invasive plants, increased recreational access, or altered predator or prey relationships that may alter wildlife dispersal and distribution patterns. The spatial extent or intensity of these indirect effects cannot be quantified at this time; therefore, the potential for these effects to occur is discussed qualitatively where appropriate.

Quantitative data used to analyze the direct effects of the Project on wildlife resources included Colorado Parks and Wildlife (CPW) designated big game habitats and migration corridors. Quantitative information regarding the status and distribution of many other wildlife species likely to occur in the Project area was not available for inclusion in the analysis. For species with limited data available for analysis, a regional qualitative evaluation of the potential occurrence of species in the Project area and potential effects was performed and described in Section 3.2.7.4.1.

G.5.6.1 Local Setting

The three routing options are located in the Colorado Plateau Ecoregion in Moffat County, Colorado. Habitats crossed by the routing options are characterized by arid shrub/shrub-steppe, big sagebrush, and pinyon-juniper vegetation types (Section G.5.4).

The three routing options start on the north side of U.S. Highway 40 and end 6.5 to 7.7 miles southwest on the south side of U.S. Highway 40. Variation 1 parallels the north side of U.S. Highway 40 for 3.8 miles, crosses Deerlodge Road in an area under NPS jurisdiction, continues north of U.S. Highway 40 for 1.9 miles, crosses U.S. Highway 40, and terminates at an existing transmission line corridor after an additional 0.8 mile. Variation 2 parallels the north side of U.S. Highway 40 for 2 miles, turns west for 2 miles, crosses Deerlodge Road on lands administered by the State of Colorado, then turns south, crosses U.S. Highway 40, and ends at an existing transmission line corridor after 3.7 miles. The route of Alternative WYCO-B immediately crosses U.S. Highway 40, runs south for 0.8 mile, and then follows an existing transmission line corridor through the Tuttle Ranch Conservation Easement for 5.7 miles.

All routing options cross severe winter habitat and designated nonlimiting (winter concentration and winter range) habitat for elk, mule deer, and pronghorn (Map G-8). The routing options addressed in this section do not cross big game calving grounds, fawning areas, crucial summer/summer concentration areas, crucial year-long habitat, or migration corridors. Elk severe winter and nonlimiting range in the Project area is the western edge of the largest contiguous area of elk nonlimiting and severe winter range in Colorado. Mule deer critical winter range in the Project area stretches from the Wyoming/Colorado state line along the major river valleys of the Little Snake in Moffat County. Mule deer nonlimiting range in the Project area is the southwestern edge of the largest contiguous mule deer nonlimiting range in Colorado. Pronghorn severe winter range is present on the northern edge of the Project area. Pronghorn nonlimiting range in the Project area is located throughout Moffat County.

The resource inventory and impact levels associated with the three routing options are presented on Map G-8.

G.5.6.2 Affected Environment

Wildlife habitats crossed by the Project include grassland, shrub-steppe, big sagebrush, pinyon-juniper, and wetland (Section G.5.4). A wide range of mammal and reptile species could occur in habitats crossed by the Project. Representative species are discussed in Section 3.2.7. Limited data are available to determine presence and relative abundance of the majority of mammal and reptile species in the Project area or to quantify many of the effects identified in Section 3.2.7.

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B is located south of U.S. Highway 40, and colocated with two existing transmission lines through the Tuttle Ranch Conservation Easement. Dominant wildlife habitats crossed by the route of Alternative WYCO-B are big sagebrush and grasslands dominated by crested wheatgrass, likely seeded following a wildfire, and cheatgrass (Section G.5.4). Wildlife habitats on lands administered by the NPS would not be crossed by Alternative WYCO-B.

The extent of big game severe winter range crossed by the route of Alternative WYCO-B is displayed in Table G-7 and shown on Map G-8. Elk severe winter range is crossed by the entire length of Links C92, C171, C174, and part of Link C173. Mule deer severe winter range is not crossed by the variation. Pronghorn severe winter range is crossed by a portion of Link C92 and a portion of Link C171.

The extent of big game nonlimiting range crossed by Alternative WYCO-B is displayed in Table G-7. Elk and pronghorn nonlimiting range is crossed by the entire length of Alternative WYCO-B. Mule deer nonlimiting range is not crossed by Alternative WYCO-B.

TABLE G-7
ROUTE VARIATION COMPARISON FOR BIG GAME HABITAT

Route Variation	**Total Miles Crossed[1]**	**Big Game Habitat (miles crossed)**					
		Elk		**Mule Deer**		**Pronghorn**	
		Severe Winter Range	**Nonlimiting Range[2]**	**Severe Winter Range**	**Nonlimiting Range[2]**	**Severe Winter Range**	**Nonlimiting Range[2]**
Alternative WYCO-B	6.5	5.0	6.5	0.0	0.0	1.3	6.5
BLM-administered land	*2.1*	*2.1*	*2.1*	*0.0*	*0.0*	*1.1*	*2.1*
Private land	*4.4*	*2.9*	*4.4*	*0.0*	*0.0*	*0.2*	*4.4*
NPS-jurisdiction crossing (Variation 1)	6.5	3.5	3.2	2.7	0.7	1.1	6.5
NPS-administered land	*0.1*	*0.0*	*0.0*	*0.1*	*0.0*	*0.0*	*0.1*
BLM-administered land	*0.2*	*0.2*	*0.2*	*0.0*	*0.0*	*0.0*	*0.2*
Private land	*6.2*	*3.3*	*3*	*2.6*	*0.7*	*1.1*	*6.2*
State-parcel crossing (Variation 2)	7.7	3.0	3.0	4.3	2.8	1.1	7.7
BLM-administered land	*1.7*	*0.2*	*0.2*	*1.5*	*1.0*	*0.0*	*1.7*
State-administered land	*1.0*	*0.0*	*0.0*	*1.0*	*1.0*	*0.0*	*1*
Private land	*5.0*	*2.8*	*2.8*	*1.8*	*0.8*	*1.1*	*5*

NOTES:
[1] Each of the big game species will not add to the total miles column due to overlapping habitats.
[2] Nonlimiting range includes winter concentration areas and winter range.
BLM = Bureau of Land Management
NPS = National Park Service

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located north of U.S. Highway 40 and crosses Deerlodge Road in an area under NPS jurisdiction. Dominant wildlife habitats crossed by Variation 1 are big sagebrush with sparse juniper cover, as well as grasslands dominated by crested wheatgrass, likely seeded following a wildfire (Section

G.5.4). Wildlife habitats on lands under NPS jurisdiction would be spanned, as Deerlodge Road is the only area under NPS jurisdiction that is crossed by Variation 1.

The extent of big game severe winter range crossed by Variation 1 is displayed in Table G-7 and shown in Map G-8. Elk and mule deer severe winter range is crossed by the entire length of Link C94 and a large portion of Link C93. Pronghorn severe winter range is crossed by a portion of Link C94.

The extent of big game nonlimiting range crossed by Variation 1 is displayed in Table G-7. Elk nonlimiting range is crossed by the entire length of Link C94. Link C93 bypasses elk nonlimiting range except for where it connects to Link C94 and C174. Mule deer nonlimiting range is crossed by Link C93. Link C94 does not cross mule deer nonlimiting range. Pronghorn nonlimiting range is crossed by the entire length of Variation 1.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and crosses Deerlodge Road on lands administered by the State of Colorado. Dominant wildlife habitats crossed by Variation 2 are big sagebrush with juniper on the hillslopes, as well as grasslands dominated by crested wheatgrass, likely seeded following a wildfire (Section G.5.4). Wildlife habitats on lands under NPS jurisdiction are not crossed by Variation 2.

The extent of big game severe winter range crossed by Variation 2 is displayed in Table G-7 and shown on Map G-8. Elk and mule deer severe winter range is crossed by the entire length of Link C94 and a large portion of Link C95. Pronghorn severe winter range is crossed by a portion of Link C94.

The extent of big game nonlimiting range crossed by Variation 2 is displayed in Table G-7. Elk nonlimiting range is crossed by the entire length of Link C94. Link C95 bypasses elk nonlimiting range except for where it connects to Link C94 and C174. Mule deer nonlimiting range is crossed by Link C95. Link C94 does not cross mule deer nonlimiting range. Pronghorn nonlimiting range is crossed by the entire length of Variation 2.

G.5.6.3 Environmental Consequences

Under all action alternatives, disturbance to wildlife habitat through temporary and permanent loss of vegetation and changes in plant assemblages would occur in the Project area. Wildlife habitats affected by the Project include grassland, shrub-steppe, big sagebrush, pinyon-juniper, and wetland (Section G.5.4). The estimated acres of disturbance associated with each habitat type are provided in Table G-6 (Section G.5.4).

Impacts on wildlife species, including birds, mammals, and reptiles would be anticipated for all three routing options. Representative raptor and upland game bird species are discussed in Sections 3.2.7 and 3.2.9. A detailed analysis of impacts on migratory birds is discussed in Section 3.2.9. Direct effects on wildlife species could include loss of habitat or alteration of habitat resulting from ground-disturbing activities during Project construction and maintenance, mortality during construction or operation of the Project, dust, disturbance from human presence or construction noise, habitat fragmentation, and dust deposition.

Vegetation removal, loss, alteration, isolation, or fragmentation of habitat due to road and tower construction would result in temporary or permanent displacement of individuals from occupied habitat. Loss or alteration of wildlife habitat would not occur on lands under NPS jurisdiction as all NPS-administered lands would be spanned by the Project. Adverse impacts could occur on foraging and nesting habitat, particularly for ground-nesting birds, upland game birds, and sagebrush obligate wildlife species.

Potential effects on migratory species include the loss, alteration, or degradation of stop-over habitat, particularly in concentration areas associated with the Yampa River system. Impacts on migratory bird habitat associated with the Yampa River are anticipated to be localized and are not anticipated to affect migratory bird resources in Dinosaur National Monument. All route variations would cross the Yampa River in the same location, outside of the analysis area. Dinosaur National Monument is located approximately 11 miles from the Yampa River crossing. Impacts on birds would be minimized by applying conservation measures (design features of the Proposed Action and selective mitigation measures) to protect nests.

Adverse impacts on mammals and reptiles potentially could be greater for species with limited range, species with low levels of mobility, or species that depend on microclimates for survival. Effects of the Project on species with these characteristics are not anticipated to extend to Dinosaur National Monument. Depending on the variation selected, the Project would be located between 6 and 8 miles from Dinosaur National Monument.

Mortality of birds, including waterfowl and migratory bird species could occur directly due to collisions with the transmission line or towers, although the probability is likely to be a function of bird morphology, behavior and species (Avian Power Line Interaction Committee [APLIC] 2012; Janss 2000). Mortality of birds also could occur through electrocution. Research suggests species at higher risk of mortality from electrocution are raptor species and thermal soarers (Janss 2000). Electrocution risk would be minimized through avian-safe transmission line design that separates energized and grounded structures (APLIC 2006). Increased mortality of mammal and reptile species could occur through collisions with Project construction equipment or vehicles. Risk of mortality or injury is likely to be a function of species morphology and behavior. Mortality of birds, mammals, and reptiles could occur indirectly as a result of increased predation pressure by predators attracted to the transmission line, or through nest abandonment resulting from increased human disturbance, which potentially could reduce fitness, survival, and reproductive performance of some individuals (Riffell et al. 1996).

Increased human presence and noise associated with Project construction, operations, and maintenance activities could increase the potential for disturbance to wildlife. Heavy machinery would be used during the construction phases for access road improvement and construction, construction site preparation, excavation and potential blasting, drilling of concrete piers, and cleanup and site reclamation. All phases of the Project would involve vehicle use, periodically increasing noise levels. Project operation activities would consist of routine inspections and would require access-road use by inspection vehicles. Potential maintenance activities would consist of access-road maintenance and right-of-way vegetation maintenance.

Human presence and construction noise associated with Project construction, operations, and maintenance activities could increase the potential for disturbance to wildlife species dispersing through the Project area. Effects would be greatest during the construction phases of the Project, when human presence, noise, and vehicle use would be substantially greater than other phases of the Project. For the purpose of this analysis, potential effects of noise were assumed to occur where noise levels increased more than 10 dBA above ambient levels, and included all areas within 1 mile of the transmission line route. The total area (in acres) that potentially could be affected by increased noise levels of more than 10 dBA within 1 mile of each routing option is displayed in Table G-8.

TABLE G-8
ROUTE VARIATION COMPARISON FOR AREAS POTENTIALLY AFFECTED BY INCREASED NOISE LEVELS OF MORE THAN 10 DECIBELS (A-WEIGHTED)

Route Variation	Total Area within 1 mile of Route Variation Centerline (acres)
Alternative WYCO-B	10,282
NPS-administered land	*0*
BLM-administered land	*3,660*
Private land	*6,598*
State-administered land	*24*
NPS-jurisdiction crossing (Variation 1)	10,302
NPS-administered land	*69*
BLM-administered land	*3,090*
Private land	*159*
State-administered land	*6,984*
State-parcel crossing (Variation 2)	11,723
NPS-administered land	*110*
BLM-administered land	*4,217*
Private land	*637*
State-administered land	*6,760*

NOTES:
BLM = Bureau of Land Management
NPS = National Park Service

Human presence and construction noise effects resulting from construction activities may persist for up to 3 years, the anticipated duration of Project construction, although the majority of Project construction activities are anticipated to be completed within 2 years. Following construction, effects would be limited to periodic disturbance and noise associated with vehicle use and human presence during maintenance and operation activities, including inspections, repairs, and vegetation management and the indirect effects of avoidance of new access roads created for the Project. Operation of the transmission line is not anticipated to result in noise levels that adversely would affect wildlife species.

Birds can respond negatively to the presence of humans and may respond by flushing from nests or roosting sites. Noise has been demonstrated in many studies to have a negative effect on nesting birds. An increased noise floor during periods when a bird is engaging in territory maintenance requires a greater energetic expense to change song pitch or increase song volume (Rheindt 2003; Brumm 2004), potentially decreasing energy available for foraging and feeding young. This can reduce occupancy or reduce productivity on occupied territories (Parris and Schneider 2009; Bayne et al. 2008; Halfwerk et al. 2011). These effects are strongest near the noise source, and additional effects such as behavioral change or hearing loss can occur at very close distances or at the highest noise intensities. Project design features, including avoidance of areas supporting actively nesting birds during the migratory bird nesting season, would minimize the potential effects of increased noise on birds.

The response of mammals to human presence and construction noise could include disruption of species behavioral patterns and displacement during Project construction. Movement of small- and medium-sized species is likely to be restricted (i.e., by limited availability of alternative quality habitat in proximity to occupied habitat affected by the Project). For displaced territorial species, movement patterns and alternative habitat could be restricted by adjacent defended territories (Feldhamer et al. 2003). Wide-ranging species may shift temporal or spatial activity and movement patterns in response to construction noise and the presence of humans and construction equipment (Feldhamer et al. 2003).

Impacts specific to big game species are described below for each route variation.

Alternative WYCO-B (Links C92, C171, C173, and C174)

Based on the impact assessment criteria used in this analysis (refer to Table 3-79 in Section 3.2.7.4.2), residual impacts on big game crucial habitat crossed by the route of Alternative WYCO-B would be low (Table G-9). Impacts primarily would be limited to loss or disturbance of crucial habitats that occurs outside sensitive periods. Low impacts are anticipated due to the application of Selective Mitigation Measures 12 and 15, which would apply seasonal restrictions for construction and maintenance activities in big game crucial habitat and limit public use of access roads where feasible (refer to Section 3.2.7.4.2 for detailed descriptions of selective mitigation measures). In areas where big game crucial habitats are not crossed, no residual impacts were identified using the EIS methods of analysis (Table G-9). Residual impacts from the route of Alternative WYCO-B on big game crucial habitat would be similar to Variation 1 but less than Variation 2. The types of potential effects on big game and other wildlife that could occur under all routing options and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.7.

TABLE G-9
ROUTE VARIATION COMPARISON FOR BIG GAME SPECIES RESIDUAL IMPACTS

Route Variation	**Total Miles Crossed**	**Big Game Crucial Habitat[1](miles crossed)**			
		Nonidentifiable[2]	**Low**	**Moderate**	**High**
Alternative WYCO-B	6.5	1.5	5.0	0.0	0.0
BLM land	*2.1*	*0.0*	*2.1*	*0.0*	*0.0*
Private land	*4.4*	*1.5*	*2.9*	*0.0*	*0.0*
NPS-jurisdiction crossing (Variation 1)	6.5	1.1	5.4	0.0	0.0
NPS-administered land	*0.1*	*0.0*	*0.1*	*0.0*	*0.0*
BLM-administered land	*0.2*	*0.0*	*0.2*	*0.0*	*0.0*
Private land	*6.2*	*1.1*	*5.1*	*0.0*	*0.0*
State-parcel crossing (Variation 2)	7.7	0.8	6.9	0.0	0.0
BLM-administered land	*1.7*	*0.0*	*1.7*	*0.0*	*0.0*
State-administered land	*1.0*	*0.0*	*1.0*	*0.0*	*0.0*
Private land	*5.0*	*0.8*	*4.2*	*0.0*	*0.0*

NOTES:
[1] Includes impacts on elk, mule deer, and pronghorn severe winter range.
[2] Miles are along the reference centerlines where none of the modeled habitats listed in the previous note occur.
BLM = Bureau of Land Management
NPS = National Park Service

The route of Alternative WYCO-B is anticipated to result in 99 acres of total ground disturbance due to construction of Project features. Of the 99 acres of total ground disturbance, 72 acres would consist of temporary disturbance and 27 acres would consist of permanent disturbance. For all routing options, all areas subject to temporary disturbance would be revegetated in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the POD.

The estimated amount of ground disturbance (in acres) on elk, mule deer, and pronghorn severe winter and nonlimiting range due to construction of Project features along Alternative WYCO-B is presented in Table G-10. Ground disturbance in big game or other wildlife habitats associated with the route of Alternative WYCO-B is not anticipated to occur on lands administered by the NPS. Alternative WYCO-B does not cross any areas under NPS jurisdiction.

TABLE G-10
ROUTE VARIATION COMPARISON FOR BIG GAME HABITAT

Route Variation	**Total Disturbance (acres)[1]**	**Big Game Habitat (acres)**					
		Elk		**Mule Deer**		**Pronghorn**	
		Severe Winter Range	**Nonlimiting Range[2]**	**Severe Winter Range**	**Nonlimiting Range[2]**	**Severe Winter Range**	**Nonlimiting Range[2]**
Alternative WYCO-B	99	76	99	0	0	20	99
BLM-administered land	*32*	*32*	*32*	*0*	*0*	*17*	*32*
State-administered land	*67*	*44*	*67*	*0*	*0*	*3*	*67*
NPS-jurisdiction crossing (Variation 1)	94	51	46	39	10	16	94
NPS-administered land[3]	–	–	–	–	–	–	–
BLM-administered land	*3*	*3*	*3*	*0*	*0*	*0*	*3*
Private land	*89*	*48*	*43*	*38*	*10*	*16*	*89*
State-parcel crossing (Variation 2)	119	46	46	67	43	17	119
BLM-administered land	*26*	*3*	*3*	*23*	*16*	*0*	*26*
State-administered land	*15*	*0*	*0*	*16*	*16*	*0*	*16*
Private land	*77*	*43*	*43*	*28*	*12*	*17*	*77*

NOTES:
[1] Refers to ground disturbance due to construction of Project features.
[2] Includes elk, mule deer, and pronghorn winter concentration and winter range.
[3] No disturbance to big game habitats on NPS-administered lands are anticipated as all lands under NPS-jurisdiction would be spanned by the Project.
BLM = Bureau of Land Management
NPS = National Park Service

The amount of ground disturbance in elk habitat from the route of Alternative WYCO-B would be greater than the other two routing options, but Alternative WYCO-B would not affect mule deer habitat. The amount of big game severe winter and nonlimiting range crossed by the route of Alternative WYCO-B is a relatively small area compared to larger areas of big game sensitive habitat in Moffat County and in Colorado as a whole that are undisturbed by the Project.

The route of Alternative WYCO-B crosses the western edge of elk severe winter range in Colorado, leaving the majority of the approximately 7 million acres of elk severe winter range (located east of the variation) in Colorado and approximately 1 million acres of elk severe winter range in Moffat County unaffected by the Project (CPW 2011). Pronghorn severe winter range is present only on the northern edge of Alternative WYCO-B, leaving the majority of the approximately 1.4 million acres of severe winter range in Colorado and 287,000 acres in Moffat County unaffected (CPW 2012b). Additionally, no big game calving grounds, fawning areas, or crucial year-long habitat are crossed; therefore, Variation 1 is not anticipated to affect big game reproduction.

Big game habitat that would be affected by the route of Alternative WYCO-B is already disturbed to some degree due to its proximity to two existing transmission lines and existing alterations in native-plant-species composition. The route of Alternative WYCO-B parallels existing 345kV and 138kV transmission lines and associated access roads in an area dominated by big sagebrush, crested wheatgrass, and cheatgrass, a non-native annual grass. Although Alternative WYCO-B is not likely to additionally affect habitat quality at a level that would adversely influence the local big game populations, the Tuttle Ranch Conservation Easement is recognized by CPW as containing high-quality winter range and migratory routes for the largest elk and mule deer herds in Colorado, and local pronghorn populations (CPW 2013). The CPW considers big game habitat south of U.S. Highway 40 in the Tuttle Ranch Conservation Easement is of higher value and importance for big game species than habitat north of U.S.

Highway 40 (CPW 2013). However, this analysis demonstrates that none of the three routing options are anticipated to result in significant impacts on big game habitats.

In addition to ground disturbance in big game habitat due to construction of Project features, other effects on big game resulting from Alternative WYCO-B could include displacement or disturbance of big game populations due to noise and human presence during Project construction and maintenance activities. Noise associated with Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Alternative WYCO-B. The total area (in acres) that potentially could be affected by increased noise levels of more than 10 dBA within 1 mile of Alternative WYCO-B is displayed in Table G-8. Lands under NPS jurisdiction are not anticipated to be affected by increased noise levels resulting from Alternative WYCO-B. Displacement or disturbance due to noise and human presence is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Project maintenance activities would include inspection of the transmission line three times annually; other maintenance and repairs would occur on an as-needed basis. In addition, seasonal restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied during times that big game are most sensitive or use specific seasonal habitats, further reducing the potentially effects of displacement or disturbance due to noise and human presence.

Long-term impacts from Alternative WYCO-B on big game habitat would be limited to minor loss of forage in seasonal habitat areas (Table G-10), and a potential increase in weeds and human presence and activity in these habitats due to construction of new access routes. Of the 99 acres of total ground disturbance anticipated due to construction of Project features, only 27 acres would consist of permanent disturbance. The remaining 72 acres would be revegetated using an agency-approved species list in accordance with the Project’s Reclamation, Revegetation, and Monitoring Plan Framework of the POD. Long-term impacts on big game habitat are not anticipated to result in reduction of big game populations from current population levels in the Project area or on big game populations in Dinosaur National Monument.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Based on the impact assessment criteria used in this analysis (refer to Table 3-79 in Section 3.2.7.4.2), residual impacts on big game crucial habitat crossed by Variation 1 would be low (Table G-9). Impacts primarily would be limited to loss or disturbance of crucial habitats that occurs outside sensitive periods. Low impacts are anticipated due to the application of Selective Mitigation Measures 12 and 15, which would apply seasonal restrictions for construction and maintenance activities in big game crucial habitat and limit public use of access roads where feasible (refer to Section 3.2.7.4.2 for detailed descriptions of selective mitigation measures). In areas where big game crucial habitats are not crossed, no residual impacts were identified using the EIS methods of analysis (Table G-9). The types of potential effects on big game and other wildlife that could occur along all alternative routes, and the degree to which these effects would be mitigated or avoided, are described in detail in Section 3.2.7.

Variation 1 is anticipated to result in 94 acres of total ground disturbance due to construction of Project features. Of the 94 acres of total ground disturbance, 72 acres would consist of temporary disturbance and 22 acres would consist of permanent disturbance. All areas subject to temporary disturbance would be revegetated in accordance with the Project’s Reclamation, Revegetation, and Monitoring Plan Framework of the POD. The estimated amount of ground disturbance (in acres) on elk, mule deer, and pronghorn severe winter and nonlimiting range due to construction of Project features by Variation 1 is presented in Table G-10. No temporary or permanent ground disturbance to areas under NPS jurisdiction would occur as Variation 1 would span Deerlodge Road and construction of Project features would not be required on NPS-administered lands.

The amount of big game severe winter and nonlimiting range crossed by Variation 1 is a relatively small area compared to larger areas of big game habitat in Moffat County and in Colorado as a whole that are undisturbed by the Project. Variation 1 crosses the western edge of elk severe winter range in Colorado, leaving the majority of the approximately 7 million acres of elk severe winter range (located east of the variation) in Colorado and approximately 1 million acres of elk severe winter range in Moffat County unaffected by the Project (CPW 2011). Mule deer severe winter range crossed by Variation 1 stretches from the Wyoming/Colorado state line along the major river valleys of the Little Snake in Moffat County, totaling approximately 8.1 million acres in Colorado and approximately 751,000 acres in Moffat County (CPW 2012a). Pronghorn severe winter range is present only on the northern edge of Variation 1, leaving the majority of the approximately 1.4 million acres of severe winter range in Colorado and 287,000 acres in Moffat County unaffected (CPW 2012b). Additionally, no big game calving grounds, fawning areas, or crucial year-long habitat are crossed; therefore, Variation 1 is not anticipated to affect big game reproduction.

Big game habitat that would be affected by Variation 1 is already disturbed due to its proximity to U.S. Highway 40 and existing alterations in native plant species composition. Variation 1 parallels U.S. Highway 40 for most of its length in an area dominated by big sagebrush and crested wheatgrass, a non-native grass that was likely seeded following a wildfire. Thus Variation 1 is unlikely to additionally affect habitat quality at a level that would adversely influence the local big game populations.

Variation 1 is anticipated to have less of an impact on big game populations than the route of Alternative WYCO-B because there is already significant human disturbance in the vicinity of the highway and existing transmission lines adjacent to U.S. Highway 40 (CPW 2013). Local big game populations may already be tolerant of, or have adapted to some level of anthropogenic disturbance because big game habitats are located in an area of existing disturbance. Furthermore, CPW considers big game habitats north of U.S. Highway 40 to be of lower value and importance for big game species than habitat south of U.S. Highway 40 (CPW 2013). However, this analysis demonstrates that none of the routing options are anticipated to result in significant impacts on big game habitats.

In addition to ground disturbance in big game habitat due to construction of Project features, other effects on big game resulting from Variation 1 could include displacement or disturbance of big game populations due to noise and human presence during Project construction and maintenance activities. Disruption to species behavioral patterns and an increase in physiological stress from construction noise and activity or routine inspections and maintenance activities also could occur. Noise associated with Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 1. The total area (in acres) that potentially could be affected by increased noise levels of more than 10 dBA within 1 mile of Variation 1 is displayed in Table G-8. On lands under NPS jurisdiction, a total of 69 acres potentially could be affected by increased noise levels. However, the area under NPS jurisdiction that potentially could be affected by increased noise levels is Deerlodge Road. Wildlife resources that cross Deerlodge Road likely already experience some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance due to noise and human presence from Project activities is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Project maintenance activities would include inspection of the transmission line three times annually; other maintenance and repairs would occur on an as-needed basis. In addition, seasonal restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied during times that big game are most sensitive or use specific seasonal habitats, further reducing the potential effects of displacement or disturbance due to noise and human presence.

Long-term impacts from Variation 1 on big game habitat would be limited to minor loss of forage in seasonal habitat areas (Table G-9), and a potential increase in weeds and human presence and activity in these habitats due to construction of new access routes. Of the 94 acres of total ground disturbance anticipated due to construction of Project features, only 22 acres would consist of permanent disturbance. The remaining 72 acres would be revegetated using an agency-approved species list in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the POD. Long-term impacts on big game habitat are not anticipated to result in reduction of big game populations from current population levels in the Project area or on big game populations in Dinosaur National Monument.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Based on the impact assessment criteria used in this analysis (refer to Table 3-79 in Section 3.2.7.4.2), residual impacts on big game crucial habitat crossed by Variation 2 would be low (Table G-9). Impacts primarily would be limited to loss or disturbance of crucial habitats that occurs outside sensitive periods. Low impacts are anticipated due to the application of Selective Mitigation Measures 12 and 15, which would apply seasonal restrictions for construction and maintenance activities in big game crucial habitat and limit public use of access roads where feasible (refer to Section 3.2.7.4.2 for detailed descriptions of selective mitigation measures). In areas where crucial habitats are not crossed, no residual impacts were identified using the EIS methods of analysis (Table G-9). Residual impacts from Variation 2 on big game crucial habitat would be greater than the other two routing options as a result of its longer length. The types of potential effects on big game and other wildlife that could occur under all alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.7.

Variation 2 is anticipated to result in 119 acres of total ground disturbance due to construction of Project features. Of the 119 acres of total ground disturbance, 86 acres would consist of temporary disturbance and 33 acres would consist of permanent disturbance. All areas subject to temporary disturbance would be revegetated in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the POD. The estimated amount of ground disturbance (in acres) on elk, mule deer, and pronghorn severe winter and nonlimiting range due to construction of Project features by Variation 2 is presented in Table G-10. Ground disturbance in big game or other wildlife habitats associated with Variation 2 would not occur on lands administered by the NPS. Variation 2 does not cross any areas under NPS jurisdiction.

The amount of big game severe winter and nonlimiting range crossed by Variation 2 is a relatively small area compared to larger areas of big game habitat in Moffat County and in Colorado as a whole that are undisturbed by the Project.

Variation 2 crosses the western edge of elk severe winter range in Colorado, leaving the majority of the approximately 7 million acres of severe winter range (located east of the variation) in Colorado and approximately 1 million acres of elk severe winter range in Moffat County unaffected by the Project (CPW 2011). Mule deer severe winter range crossed by Variation 2 stretches from the Wyoming/Colorado state line along the major river valleys of the Little Snake in Moffat County, totaling approximately 8.1 million acres in Colorado and approximately 751,000 acres in Moffat County (CPW 2012a). Pronghorn severe winter range is present only on the northern edge of Variation 2, leaving the majority of the approximately 1.4 million acres of severe winter range in Colorado and 287,000 acres in Moffat County unaffected. Additionally, no big game calving grounds, fawning areas, or crucial year-long habitat are crossed; therefore, Variation 2 is not anticipated to affect big game reproduction.

The CPW considers big game habitats north of U.S. Highway 40 to be of lower value and importance for big game species than habitat south of U.S. Highway 40 (CPW 2013). However, big game habitat that would be affected by Variation 2 is relatively undisturbed compared to the other two route variations. Although Link C94 parallels U.S. Highway 40 in an area dominated by big sagebrush and crested wheatgrass, Link C95 is relatively undisturbed in terms of its native plant species composition and landscape position. Vegetation in this area appears to be characterized by greater native plant species diversity and less disturbed by historic wildfires than links association with the other route variations

(Section 3.2.5). A large portion of Link C95 is located in an area without other major disturbance such as major roads or other transmission lines. Variation 2 would result in an additional parallel disturbance within a relatively short distance to other existing parallel disturbances (i.e., U.S. Highway 40 or the existing transmission line corridor), but is not likely to additionally affect habitat quality at a level that would adversely influence the local big game populations.

In addition to ground disturbance in big game habitat due to construction of Project features, other effects on big game resulting from Variation 2 could include displacement or disturbance of big game populations due to noise and human presence during Project construction and maintenance activities. Noise associated with Project construction activities is anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 2. The total area (in acres) that potentially could be affected by increased noise levels of more than 10 dBA within 1 mile of Variation 2 is displayed in Table G-8. On lands under NPS jurisdiction, a total of 110 acres potentially could be affected by increased noise levels. However, the area under NPS jurisdiction that potentially could be affected by increased noise levels is Deerlodge Road. Wildlife resources that cross Deerlodge Road likely already experience some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance due to noise and human presence from Project activities is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Project maintenance activities would include inspection of the transmission line three times annually; other maintenance and repairs would occur on an as-needed basis. In addition, seasonal restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied during times that big game are most sensitive or use specific seasonal habitats, further reducing the potential effects of displacement or disturbance due to noise and human presence.

Long-term impacts from Variation 2 on big game habitat would be limited to minor loss of forage in seasonal habitat areas (Table G-10), and a potential increase in weeds and human presence and activity in these habitats due to construction of new access routes. Of the 119 acres of total ground disturbance anticipated due to construction of Project features, only 33 acres would consist of permanent disturbance. The remaining 86 acres would be revegetated using an agency-approved species list in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the POD. Long-term impacts on big game habitat are not anticipated to result in reduction of big game populations from current population levels in the Project area or on big game populations in Dinosaur National Monument.

G.5.6.4 Summary

All three routing options cross similar types of wildlife habitats and would have similar types of impacts. Additionally, potential impacts on wildlife resources could be reduced through implementation of Project design features for environmental protection (Table 2-8) and selective mitigation measures (Table 2-13) for all routing options. Differences in impacts on wildlife resources among the three routing options are largely driven by the landscape position of the routing options relative to other existing disturbances.

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B is located south of U.S. Highway 40 and colocated with two existing transmission lines through the Tuttle Ranch Conservation Easement. Elk and pronghorn severe winter and nonlimiting range are crossed by Alternative WYCO-B. Residual impacts on big game crucial range would consist mostly of low impacts. Impacts primarily would be limited to loss or disturbance of crucial habitats that occurs outside sensitive periods. Long-term impacts on big game habitat are not anticipated to result in reduction of big game populations from current population levels in the Project area or on big game populations in Dinosaur National Monument.

Loss of wildlife habitats associated with Alternative WYCO-B would not occur on lands administered by the NPS as Alternative WYCO-B does not cross any areas under NPS jurisdiction. Temporary displacement or disturbance to wildlife species are not anticipated to occur on lands under NPS jurisdiction as a result of increased noise associated with Project construction activities.

Alternative WYCO-B is located approximately 8 miles from Dinosaur National Monument and could indirectly affect wide-ranging wildlife populations in Dinosaur National Monument if habitat loss, mortality, displacement or disturbance resulting from Project activities prevents movement of individuals that otherwise would use habitats in Dinosaur National Monument. However, these effects are anticipated to be minimal as a result of seasonal restrictions on construction and maintenance activities that would be applied during times that special status wildlife are most sensitive or use specific seasonal habitats. In addition, Alternative WYCO-B is not anticipated to present a significant additional barrier to wildlife movement. Alternative WYCO-B is located primarily in a designated utility corridor (on federal land) and adjacent to linear disturbances including U.S. Highway 40 and an existing high-voltage transmission line.

The length of Alternative WYCO-B is the same as Variation 1 and less than Variation 2 and would therefore result in similar residual impacts on big game habitats and overall disturbance (in acres) of wildlife habitats as Variation 1 and less residual impacts on big game habitats and overall ground disturbance (in acres) to wildlife habitats than Variation 2 (Table G-9 and Table G-10). Alternative WYCO-B is anticipated to result in 99 acres of disturbance, compared to 94 acres for Variation 1 and 119 acres for Variation 2. Wildlife habitats adjacent to Alternative WYCO-B already are disturbed, primarily due to their proximity to two existing transmission lines and existing alterations in native plant species composition. However, Alternative WYCO-B would expand the existing disturbed area.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located adjacent to but north of U.S. Highway 40 and crosses the Deerlodge Road in an area under NPS jurisdiction. Elk, mule deer, and pronghorn severe winter and nonlimiting range would be crossed by Variation 1. Residual impacts on big game crucial range would consist mostly of low impacts. Impacts primarily would be limited to loss or disturbance of crucial habitats that occurs outside sensitive periods. Long-term impacts on big game habitat are not anticipated to result in reduction of big game populations from current population levels in the Project area or on big game populations in Dinosaur National Monument.

Loss of wildlife habitats associated with Variation 1 would not occur on lands administered by the NPS as Variation 1 would span the area of Deerlodge Road under NPS jurisdiction. Temporary displacement or disturbance to wildlife species could occur on lands under NPS jurisdiction as a result of increased noise associated with Project construction activities. Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 1 and could affect a total of 69 acres on lands under NPS jurisdiction. However, the area under NPS jurisdiction that potentially could be affected by increased noise levels is Deerlodge Road. Wildlife resources that cross Deerlodge Road likely already experience some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance from wildlife habitats due to construction noise is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Wildlife mortality associated with bird transmission line collisions, or mammal and reptile collisions with Project construction equipment or vehicles, could occur along Deerlodge Road on lands under NPS-jurisdiction. This potential effect is likely to be minimal as the area crossed under NPS jurisdiction is limited to the width of Deerlodge Road.

Variation 1 is located approximately 8 miles from Dinosaur National Monument and could indirectly affect wide-ranging wildlife populations in Dinosaur National Monument if habitat loss, mortality, displacement or disturbance resulting from Project activities prevents movement of individuals that would otherwise use habitats in Dinosaur National Monument. However, these effects are anticipated to be minimal as a result of seasonal restrictions on construction and maintenance activities that would be applied during times that wildlife are most sensitive or use specific seasonal habitats. In addition, Variation 1 is not anticipated to present a significant additional barrier to wildlife movement. The route would follow the Highway 40 corridor and be concentrated with other development and human disturbance associated with the highway and residences, including existing transmission lines adjacent to U.S. Highway 40.

The length of Variation 1 is the same as Alternative WYCO-B; therefore, the residual impacts on big game habitats and the overall amount of disturbance (in acres) of wildlife habitats is similar to Alternative WYCO-B (Table G-9 and Table G-10). However, Variation 1 is anticipated to have less impact on big game populations than Alternative WYCO-B because there is already significant human disturbance in the vicinity of the highway and existing transmission lines adjacent to U.S. Highway 40.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and crosses Deerlodge Road on lands administered by the State of Colorado. Elk, mule deer, and pronghorn severe winter and nonlimiting range is crossed by Variation 2. Residual impacts on big game crucial range would consist mostly of low impacts. Impacts primarily would be limited to loss or disturbance of crucial habitats that occurs outside sensitive periods. Long-term impacts on big game habitat are not anticipated to result in reduction of big game populations from current population levels in the Project area or on big game populations in Dinosaur National Monument.

Loss of wildlife habitats associated with Variation 2 would not occur on lands administered by the NPS as Variation 2 does not cross any areas under NPS jurisdiction. Temporary displacement or disturbance of wildlife species could occur on lands under NPS jurisdiction as a result of increased noise associated with Project construction activities. Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 1 and could affect a total of 110 acres on lands under NPS jurisdiction. However, the area under NPS jurisdiction that potentially could be affected by increased noise levels is Deerlodge Road. Wildlife resources that cross Deerlodge Road likely already experience some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance from wildlife habitats due to construction noise is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years.

Variation 2 is located approximately 6 miles from Dinosaur National Monument and could indirectly affect wide-ranging wildlife populations in Dinosaur National Monument if habitat loss, mortality, displacement or disturbance resulting from Project activities prevents movement of individuals that would otherwise use habitats in Dinosaur National Monument. However, these effects are anticipated to be minimal as a result of seasonal restrictions on construction and maintenance activities that would be applied during times that wildlife are most sensitive or use specific seasonal habitats.

The length of Variation 2 is longer than Variation 1 and Alternative WYCO-B and therefore would result in greater residual impacts on big game habitats (Table G-9) and a greater amount of overall ground disturbance to wildlife habitats (in acres) as Variation 1 and Alternative WYCO-B (119 acres versus 94 and 99 acres, respectively; Table G-10). Variation 2 also would result in a novel additional disturbance of wildlife resources as compared to the other route variations because the majority of the route would not be contiguous with other existing parallel disturbances (i.e., U.S. Highway 40 or the existing transmission line corridor).

G.5.7 Special Status Wildlife

This section describes the existing condition of special status wildlife and analyzes the potential effects on special status wildlife that could result from construction, operation, and maintenance of the Project in the vicinity of the Dinosaur National Monument Deerlodge Road. Special status wildlife include species listed as threatened, endangered, or candidates under the ESA; species listed as sensitive by the USFS or BLM; and species listed as threatened, endangered, or are considered by the State of Colorado to be of special concern. Analysis of potential effects on other wildlife species is provided in Section G.5.5; analysis of potential effects on fish and aquatic resources is contained in Section G.5.8. This analysis tiers to the broader assessment in Section 3.2.8.

Lists of special status species that may occur in the study corridors around the routing options addressed in this document were collected from the FWS (Moffat County), BLM (state level), and CPW. Using the information collected, the full list of special status species was refined to include only species with the potential to occur in the Project area and is presented in Table G-11. Detailed species descriptions, life history, status, and occurrence information for each special status species that may occur in the Project area are included in Appendix J.

TABLE G-11
SPECIAL STATUS WILDLIFE SPECIES LIKELY TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Status
Birds		
American peregrine falcon	*Falco peregrinus anatum*	BLM sensitive; state species of special concern
Bald eagle	*Haliaeetus leucocephalus*	BLM sensitive; state species of special concern
Burrowing owl	*Athene cunicularia*	State threatened
Ferruginous hawk	*Buteo regalis*	BLM sensitive; state species of special concern
Greater sage-grouse	*Centrocercus urophasianus*	BLM sensitive; FWS candidate; state species of special concern
Greater sandhill crane	*Grus canadensis tabida*	State species of special concern
Long-billed curlew	*Numenius americanus*	BLM sensitive; state species of special concern
Mountain plover	*Charadrius montanus*	BLM sensitive; state species of special concern
Mammals		
Black-footed ferret	*Mustela nigripes*	FWS endangered (non-essential experimental population); state endangered
Kit fox	*Vulpes macrotis*	BLM sensitive; state endangered
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	BLM sensitive; state species of special concern
White-tailed prairie dog	*Cynomys leucurus*	BLM sensitive; FWS species of concern
Reptiles		
Midget faded rattlesnake	*Crotalus viridis concolor*	State species of special concern

NOTES:
BLM = Bureau of Land Management
FWS = U.S. Fish and Wildlife Service

Direct effects (those that take place at the same time or in the same location as the Proposed Action) of the Project on special status wildlife species analyzed could include loss of habitat resulting from ground-disturbing activities, mortality during construction or operation of the Project, disturbance from human presence or construction noise, habitat fragmentation, and dust deposition. Effects such as mortality were considered to be limited to areas where ground disturbance would be proposed or where existing access roads would be used by Project vehicles.

The extent of habitat loss that may occur as a result of construction, operation, and maintenance of the Project was estimated using the best available information from the Applicant to provide an estimate of the extent of potential impacts on special status species. Prior to final engineering design of the Project, the location of Project features such as new access roads, upgrades to existing roads, drive-and-crush areas, transmission line structures, and other Project facilities have not been identified. The analysis was completed by estimating the total disturbance in acres due to construction of features such as the Project access network (construction of new roads, upgrades to existing roads, drive-and-crush travel), transmission line structures, and other Project facilities over the entire length of the Alternative WYCO-B. The analysis assumes a constant rate of disturbance per mile of transmission line, which was calculated using the estimated total disturbance and the total length of the transmission line. The rate was then used to estimate the extent of loss of habitat (in acres) that would occur with each specific length of habitat crossed by each route variation. Habitat loss estimates include both permanent and temporary disturbances; therefore, representing an overestimate of permanent ground disturbance. Permanent disturbance included structure pad areas, communication-regeneration stations, substations and series-compensation stations, and permanent access roads. Temporary disturbance included structure work areas, wire tensioning/pulling sites, wire-splicing sites, multipurpose construction yards, helicopter fly yards, guard structures, and temporary access roads. All areas subject to temporary disturbance would be revegetated in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the POD.

Noise and associated impacts on special status wildlife was analyzed based on available information regarding noise transmission and the response of special status wildlife species. Noise effects would be greatest during the construction phases of the Project. Heavy machinery would be used during the construction phases for access road improvement and construction, construction site preparation, excavation and potential blasting, drilling of concrete piers, and cleanup and site reclamation. The specific level and duration at which noise results in adverse effects on special status wildlife is not available for most wildlife species. Noise-management strategies to reduce disturbance to birds, including sage-grouse, often limit new noise levels to 10 dBA above ambient levels (Nicholoff 2003, Wyoming Executive Order 2011-5). Due to the lack of available information regarding noise thresholds for other special status wildlife species, this analysis assumes that an increase of 10 dBA over the existing noise floor potentially would result in an adverse effect on all special status wildlife species that may be present in the Project area. Although detailed noise modeling has not been conducted for this Project, an assumed noise level of 85 dBA from construction activities requiring heavy equipment was used to support a noise analysis in a similar example (BLM and Western Area Power Administration 2014). At 85 dBA, construction activities requiring heavy equipment is anticipated to result in an increased noise floor of more than 10 dBA in areas within of 1 mile of construction activities. Therefore, for this analysis it was assumed that the potential effects of noise on special status wildlife could occur in any location within 1 mile of the transmission line route. Operation of the transmission line is not anticipated to result in noise levels that would adversely affect wildlife species; therefore, noise associated with operation of the transmission line is not included in this analysis.

Indirect effects (those that take place at a later in time or in a different location than the proposed action) of the Project on special status wildlife species analyzed could include vegetation changes such as altered fire regimes or facilitation of invasive plants, increased recreational access, or altered predator or prey relationships that may alter wildlife dispersal and distribution patterns. The spatial extent or intensity of these indirect effects cannot be quantified at this time; therefore, the potential for these effects to occur is discussed qualitatively where appropriate.

Detailed analysis of the level of impacts of the Project on special status wildlife species was performed for species for which data were available and identified as potentially present in the study area. Spatial data collected and used in the analysis is identified in Table 3-97. Special status wildlife species known to occur or that may occur in the vegetation communities crossed by the routing options for which data were available included mountain plover, greater-sage grouse, white-tailed prairie dog, and special status raptors.

Quantitative information regarding the status and distribution of many other special status wildlife species likely to occur in the Project area was not available for inclusion in the analysis. For species with limited data available for analysis, a qualitative evaluation of the potential occurrence of species in the Project area and potential effects was performed and described in Section 3.2.8.4.1.

A detailed description of the impact assessment and mitigation planning methodology is described in Section 3.2.8.4.3.

G.5.7.1 Local Setting

The three routing options are located in the Colorado Plateau Ecoregion in Moffat County, Colorado. Habitats crossed by the variations are characterized by arid shrub/shrub-steppe, big sagebrush, and pinyon-juniper vegetation types (Section G.5.4).

The three routing options start on the north side of U.S. Highway 40 and end 6.5 to 7.7 miles southwest on the south side of U.S. Highway 40. Variation 1 parallels the north side of U.S. Highway 40 for 3.8 miles, crosses Deerlodge Road in an area under NPS jurisdiction, continues north of U.S. Highway 40 for 1.9 miles, crosses U.S. Highway 40, and terminates at an existing transmission line corridor after an additional 0.8 mile. Variation 2 parallels the north side of U.S. Highway 40 for 2 miles, turns west for 2 miles, crosses Deerlodge Road on lands administered by the State of Colorado, then turns south, crosses U.S. Highway 40, and ends at an existing transmission line corridor after 3.7 miles. Alternative WYCO-B immediately crosses U.S. Highway 40, runs south for 0.8 mile, and then follows an existing transmission line corridor through the Tuttle Ranch Conservation Easement for 5.7 miles.

Special status wildlife species known to occur or that may occur in the vegetation communities crossed by the routing options include greater sage-grouse, white-tailed prairie dog, mountain plover, and other species including kit fox and burrowing owl listed in Table G-11.

Sage-grouse populations in the Project area are part of the Northwest Colorado population, Management Zone 9. The Northwest Colorado population is estimated around 12,000 birds based on average male sage-grouse lek counts (2,100 to 2,500 individual grouse) between 2000 and 2005 (Northwest Colorado Greater Sage-grouse Working Group 2008). Sage-grouse lek attendance in the Northwest Colorado population increased between 1998 and 2006, and the population was believed to be stable to increasing (Northwest Colorado Greater Sage-grouse Working Group 2008).The population appears to have undergone marked decline since 2008. Large tracts of arid, low-elevation sagebrush and salt-desert habitat in the southwest corner of Moffat County (west of Massadona) became vacant prior to the 1990s. These marginal habitats supported small, widely separated groups of breeding birds. Increased prevalence of cheatgrass and other invasive annual weeds across these shrub-scrub habitats may have contributed substantially to population declines. A single remaining lek at the eastern, higher-elevation margin of this habitat belt has maintained a small but stable number of attending males (FWS 2013).

Highways, housing development, grain farming, unreclaimed oil and gas wells, juniper woodland expansion, and inundation from water-storage projects located in and around sage-grouse habitats have directly and indirectly affected sage-grouse and sage-grouse habitats occupied by the Northwest Colorado population (Northwest Colorado Greater Sage-grouse Working Group 2008). Because of habitat conditions and connectivity, the population is considered to be at low risk, although southern portions of the population are considered less resilient to stressors than northern portions of the population due to habitat fragmentation and reduced connectivity (FWS 2013). The abundance and distribution of sage-grouse in Management Zone 9 appear to expand and contract commensurate with core population status.

White-tailed prairie dogs are locally common in northwestern Colorado, though plague, management as a pest species, and habitat loss has limited the species distribution and population size.

Black-footed ferrets may occur in the nearby Wolf Creek reintroduction management area. However, reintroduced ferrets in the Wolf Creek management area were likely lost to a plague event in 2008 and 2009 (Ausmus 2012), and the likelihood of ferrets being located in these areas is believed to be very low.

Mountain plovers are known to use disturbed, grassland, and shrubland habitats (Knopf and Miller 1994) in Colorado, though the three variation variations are on the periphery of the species' breeding range and mountain plovers are scarce in those areas (Dinsmore 2003).

The resource inventory and impact levels associated with the three route variations are presented on Map G-9.

G.5.7.2 Affected Environment

Special status wildlife habitats crossed by the three routing options include grassland, shrub-steppe, big sagebrush, pinyon-juniper, and wetland (Section G.5.4). Impacts on these habitats could adversely affect special status wildlife species.

Similar types of impacts on special status wildlife resources associated with the construction, operation, and maintenance of the Project would be anticipated for all action alternatives. Differences in the magnitude and extent of impacts anticipated among individual variations are driven by the type and quantity of special status wildlife resources present along each routing option and the degree that potential effects can be mitigated or avoided.

In addition to the species discussed in detail in this section, a wide range of special status wildlife species could be affected by the alternative routes. The species that may be present in the Project area and may be affected are listed in Table G-11 and described in Section J.6.2 of Appendix J. Limited data are available to determine presence and relative abundance of the many special status wildlife species in the Project area or to quantify many of the types of effects described in Section 3.2.8.4.3. However, effects on these species would be avoided, minimized, and mitigated to the extent practical using the methods described in Section 3.2.8.

Alternative WYCO-B (Links C92, C171, C173, and C174)

Alternative WYCO-B is located south of U.S. Highway 40, and colocated with two existing transmission lines through the Tuttle Ranch Conservation Easement. Dominant special status wildlife habitats crossed by Alternative WYCO-B are big sagebrush and grasslands dominated by crested wheatgrass, likely seeded following a wildfire, and cheatgrass (Section G.5.4). Special status wildlife habitats on lands under NPS jurisdiction are not crossed by Alternative WYCO-B.

Alternative WYCO-B crosses greater sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks in priority habitats (Table G-12 and Map G-10). The numbers of sage-grouse leks within 2, 4, and 11 miles of the variation are presented in Table G-13. Tuttle Ranch Conservation Easement is recognized by the CPW as containing extensive areas of high quality sage-grouse nesting and brood-rearing habitat (CPW 2013). Although the density of sage-grouse on the Tuttle Ranch Conservation

Easement property is relatively low compared to other portions of the Northwest Colorado population, the area provides connectivity between key areas of priority habitat from the Axial Basin to the Blue Mountain area (east to west).

TABLE G-12
ROUTE VARIATION COMPARISON FOR SPECIAL STATUS WILDLIFE (MILES CROSSED)

Route Variation	Total Miles Crossed	Greater Sage-grouse Priority Habitat	Greater Sage-grouse General Habitat	Greater Sage-grouse Habitat within 4 miles of Leks Located in Priority Habitat	White-tailed Prairie Dog Potential Colony	Mountain Plover Potential Habitat
Alternative WYCO-B	6.5	1.7	4.8	2.8	0.7	0.3
BLM-administered land	*2.1*	*1.5*	*0.6*	*1.1*	*0.2*	*0.0*
Private land	*4.4*	*0.2*	*4.2*	*1.7*	*0.5*	*0.3*
NPS jurisdiction crossing (Variation 1)	6.5	2.7	3.8	3.4	0.0	0.3
NPS-administered land	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*
BLM-administered land	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*	*0.1*
Private land	*6.2*	*2.5*	*3.7*	*3.4*	*0.0*	*0.2*
State parcel crossing (Variation 2)	7.7	3.6	0.9	3.4	0.0	0.0
BLM-administered land	*1.7*	*0.2*	*0.0*	*0.0*	*0.0*	*0.0*
State-administered land	*1.0*	*0.0*	*0.2*	*0.2*	*0.0*	*0.0*
Private land	*5.0*	*3.4*	*0.7*	*3.2*	*0.0*	*0.0*

NOTES:
BLM = Bureau of Land Management
NPS = National Park Service

TABLE G-13
SUMMARY OF SAGE-GROUSE LEK DISTANCES TO ROUTE VARIATION CENTERLINES

Route Variation	Number of Sage-grouse Leks Within 2 Miles	Number of Sage-grouse Leks Within 4 Miles	Number of Sage-grouse Leks Within 11 Miles
Alternative WYCO-B	0	3	16
National Park Service-jurisdiction crossing (Variation 1)	0	3	16
State-parcel crossing (Variation 2)	0	3	16

Alternative WYCO-B crosses white-tailed prairie dog potential colonies (Table G-12 and Map G-9). Concentrations of known and potential white-tailed prairie dog colonies are located on the Tuttle Ranch Conservation Easement.

Alternative WYCO-B crosses potential mountain plover habitat (Table G-12 and Map G-9). Potential habitat occurs along the majority of the variations considered in Colorado.

No special status raptor nests are known to occur within 1 mile of Alternative WYCO-B. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located north of U.S. Highway 40 and would cross Deerlodge Road in an area under NPS jurisdiction. Dominant special status wildlife habitats crossed by Variation 1 are big sagebrush with sparse juniper cover, as well as grasslands dominated by crested wheatgrass, likely seeded following a wildfire (Section G.5.4). Special status wildlife habitats on lands under NPS jurisdiction would be spanned, as Deerlodge Road is the only area under NPS jurisdiction that would be crossed by Variation 1.

Variation 1 crosses greater sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks in priority habitats (Table G-12 and Map G-10). The numbers of sage-grouse leks within 2, 4, and 11 miles of the variation are presented in Table G-13.

Variation 1 crosses potential mountain plover habitat (Table G-12 and Map G-9). Potential habitat occurs in the majority of the proposed rights-of-way for each of the alternative routes in Colorado.

Variation 1 does not cross white-tailed prairie dog potential colonies. No special status raptor nests are known to occur within 1 mile of Variation 1. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and would cross Deerlodge Road on lands administered by the State of Colorado. Dominant special status wildlife habitats crossed by Variation 2 are big sagebrush with juniper on the hillslopes, as well as grasslands dominated by crested wheatgrass, likely seeded following a wildfire (Section G.5.4). Special status wildlife habitats on lands under NPS jurisdiction are not crossed by Variation 2.

Variation 2 crosses greater sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks in priority habitats (Table G-12 and Map G-10). The numbers of sage-grouse leks within 2, 4, and 11 miles of the variation are presented in Table G-13.

Variation 2 does not cross potential white-tailed prairie dog potential colonies or mountain plover habitat (Table G-12). No special status raptor nests are known to occur within 1 mile of Variation 2. Raptor nest surveys would be conducted prior to construction to identify nest locations where seasonal and spatial restrictions may be required to protect nesting raptors.

G.5.7.3 Environmental Consequences

Under all action alternatives, disturbance of special status wildlife habitat through temporary and permanent loss of vegetation and changes in plant assemblages would occur along the three routing options. Special status wildlife habitats affected by the three routing options include grassland, shrub-steppe, big sagebrush, pinyon-juniper, and wetland (Section G.5.4). The estimated acres of disturbance associated with each habitat type are provided in Table G-6 (Section G.5.4).

Impacts on special status wildlife and special status wildlife habitats would be similar to those described for general wildlife species in Section G.5.6.3. Impacts specific to special status wildlife species for which data were available (i.e., mountain plover, greater sage-grouse, white-tailed prairie dog, and special status raptors) are described below for each route variation.

Alternative WYCO-B (Links C92, C171, C173, and C174)

Based on the impact assessment criteria used in this analysis (refer to Table 3-103 in Section 3.2.8.4.3), residual impacts on special status wildlife and their potential habitats crossed by the route of Alternative WYCO-B would be low and high (Table G-14). Low impacts would be a result of impacts on sage-grouse general habitats and mountain plover potential habitat. Impacts on sage-grouse general habitats and mountain plover potential habitat are considered low because they are anticipated to have only minor adverse effects on the species and would not limit the long-term sustainability of populations. Application of Selective Mitigation Measure 12 (seasonal and spatial wildlife restrictions) would restrict construction and maintenance activities to designated areas and during critical periods to minimize disturbance by limiting human activity, noise and disturbance during sensitive life cycle periods, and reduce the risk of adverse impacts on breeding success and species survival rates. Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and likely would continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete.

TABLE G-14
ROUTE VARIATION COMPARISON FOR SPECIAL STATUS WILDLIFE RESIDUAL IMPACTS

Route Variation	Total Miles Crossed	Residual Impacts (miles)[1,2]			
		Nonidentifiable[3]	Low	Moderate	High
Alternative WYCO-B	6.5	0.0	3.3	0.0	3.2
BLM-administered land	*2.1*	*0.0*	*0.6*	*0.0*	*1.5*
Private land	*4.4*	*0.0*	*2.7*	*0.0*	*1.7*
NPS-jurisdiction crossing (Variation 1)	6.5	0.0	2.4	0.0	4.1
NPS-administered land	*0.1*	*0.0*	*0.1*	*0.0*	*0.0*
BLM-administered land	*0.2*	*0.0*	*0.0*	*0.0*	*0.2*
Private land	*6.2*	*0.0*	*2.3*	*0.0*	*3.9*
State-parcel crossing (Variation 2)	7.7	3.2	0.0	0.0	4.5
BLM-administered land	*1.7*	*0.0*	*0.0*	*0.0*	*0.2*
State-administered land	*1.0*	*0.0*	*0.0*	*0.0*	*0.2*
Private land	*5.0*	*0.0*	*0.0*	*0.0*	*4.1*

NOTES:
[1] Where multiple special status wildlife species are crossed, the resource with the highest impact-level assignment was reported.
[2] Includes impacts on white-tailed prairie dog, mountain plover, and greater sage-grouse
[3] Miles are along the reference centerlines where none of the modeled habitats listed in the previous note occur.
BLM = Bureau of Land Management
NPS = National Park Service

High residual impacts on special status wildlife resources would be a result of impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. Impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats are considered high because these habitat types are considered the most important areas for maintaining individual and statewide sage-grouse populations. While selective mitigation measures (refer to Table 3-104 in Section 3.2.8.4.3) would minimize the potential effects of direct mortality and increased disturbance on sage-grouse, the presence of transmission lines and structures in sage-grouse habitat may increase susceptibility to predation, and habitat fragmentation and displacement are likely to occur due to the tendency of sage-grouse to avoid areas that contain tall structures (refer to Section 3.2.8.4.3 for detailed descriptions of potential effects of the Project on sage-grouse and other special status wildlife species).

Alternative WYCO-B is anticipated to result in 99 acres of total ground disturbance due to construction of Project features. Of the 99 acres of total ground disturbance, 72 acres would consist of temporary disturbance and 27 acres would consist of permanent disturbance. For all three routing options, all areas subject to temporary disturbance would be revegetated in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the POD. The estimated amount of ground disturbance (in acres) on special status wildlife habitats due to construction of Project features by Alternative WYCO-B is presented in Table G-10. Ground disturbance in special status wildlife habitats associated with Alternative WYCO-B would not occur on lands administered by the NPS. Alternative WYCO-B does not cross any areas under NPS jurisdiction.

From where Alternative WYCO-B joins the U.S. Highway 40 corridor to the end of the route variation, Alternative WYCO-B is located primarily in a designated utility corridor and adjacent to linear disturbances including U.S. Highway 40 and an existing high-voltage transmission line that have degraded the quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would minimize sage-grouse habitat loss and fragmentation. The amount of sage-grouse priority habitat and habitat within 4 miles of leks in priority habitat that would be disturbed by Alternative WYCO-B would be less than Variation 1 and Variation 2 (Table G-13). However, the CPW considers sage-grouse habitat on the Tuttle Ranch Conservation Easement to be of higher quality than sage-grouse habitat south of U.S. Highway 40 (CPW 2013).

The amount of white-tailed prairie dog potential colonies that would be disturbed by Alternative WYCO-B would be greater than Variation 1 and Variation 2, as Alternative WYCO-B is the only route variation that crosses white-tailed prairie dog potential colonies (Table G-10). The CPW recognizes the Tuttle Ranch Conservation Easement property as containing some of the highest densities of white-tailed prairie dog colonies anywhere in northwestern Colorado and a potential preferred location for the future release of black-footed ferrets (CPW 2013). Colonies on the property suffered from plague in 2011-12, which resulted in a severe loss of population and precluded release of ferrets on the property.

White-tailed prairie dog colonies are known to be present along the route variation. If present in the right-of-way, injury of white-tailed prairie dogs could occur during construction and maintenance of the Project. Loss and modification of their habitats would be likely to occur. White-tailed prairie dog habitats are located adjacent to existing linear infrastructure and are likely to have previously incurred some of the effects described in Section 3.2.8.

The amount of potential mountain plover habitat that would be disturbed by Alternative WYCO-B would be greater than Variation 1 and Variation 2 (Table G-13). Despite the implementation of temporal and spatial avoidance selective mitigation measures, some disturbance to mountain plovers and their habitats could occur. Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and likely would continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete.

In addition to ground disturbance in special status wildlife habitat due to construction of Project features, other effects on special status wildlife resulting from Alternative WYCO-B could include displacement or disturbance of special status wildlife populations due to noise and human presence during Project construction and maintenance activities. Noise associated with Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Alternative WYCO-B. The total area (in acres) that potentially could be affected by increased noise levels of more than 10 dBA within 1 mile of Alternative WYCO-B is displayed in Table G-8. Lands under NPS jurisdiction are not anticipated to be affected by increased noise levels resulting from Alternative WYCO-B. Displacement or disturbance due to noise and human presence is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Project maintenance activities would include inspection of the transmission line three times annually; other maintenance and repairs would occur on an as-needed basis. In addition, seasonal restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied during times that special status wildlife are most sensitive or use specific seasonal habitats, further reducing the potential effects of displacement or disturbance due to noise and human presence.

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Table 2-13, Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of selective mitigation measures are described in Section 3.2.8.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Based on the impact assessment criteria used in this analysis (refer to Table 3-103 in Section 3.2.8.4.3), residual impacts on special status wildlife and their potential habitats crossed by Variation 1 would be low and high (Table G-14). Low impacts would result from impacts on sage-grouse general habitats and mountain plover potential habitat. Impacts on sage-grouse general habitats and mountain plover potential habitat are considered low because they are anticipated to have only minor adverse effects on the species and would not limit the long-term sustainability of populations. Application of Selective Mitigation Measure 12 (seasonal and spatial wildlife restrictions) would restrict construction and maintenance activities to designated areas and during critical periods to minimize disturbance by limiting human activity, noise and disturbance during sensitive life cycle periods, and reduce the risk of adverse impacts on breeding success and species survival rates. Mountain plovers often breed near areas disturbed by construction and other human activities (Knopf and Miller 1994), and likely would continue to utilize habitats affected by the transmission line, including access roads, tower work areas, and adjacent areas once construction is complete.

High residual impacts on special status wildlife resources would be due to impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. Impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats are considered high because these habitat types are considered the most important areas for maintaining individual and statewide sage-grouse populations. While selective mitigation measures (refer to Table 3-104 in Section 3.2.8.4.3) would minimize the potential effects of direct mortality and increased disturbance on sage-grouse, the presence of transmission lines and structures in sage-grouse habitat may increase susceptibility to predation, and habitat fragmentation and displacement are likely to occur due to the tendency of sage-grouse to avoid areas that contain tall structures (refer to Section 3.2.8.4.3 for detailed descriptions of potential effects of the Project on sage-grouse and other special status wildlife species).

Variation 1 is anticipated to result in 94 acres of total ground disturbance due to construction of Project features. Of the 94 acres of total ground disturbance, 72 acres would consist of temporary disturbance and 22 acres would consist of permanent disturbance. All areas subject to temporary disturbance would be revegetated in accordance with the Project’s Reclamation, Revegetation, and Monitoring Plan Framework of the POD. The estimated amount of ground disturbance (in acres) on special status wildlife habitats due to construction of Project features by Variation 1 is presented in Table G-10. No temporary or permanent ground disturbance to areas under NPS jurisdiction would occur as Variation 1 would span Deerlodge Road and construction of Project features would not be required on NPS lands.

Special status wildlife habitat that would be affected by Variation 1 is already disturbed due to its proximity to U.S. Highway 40 and existing alterations in native plant species composition. Variation 1 parallels U.S. Highway 40 for most of its length in an area dominated by big sagebrush and crested wheatgrass, a non-native grass that was likely seeded following a wildfire. Thus Variation 1 is unlikely to additionally affect habitat quality at a level that would adversely influence local special status wildlife populations.

In addition to ground disturbance in special status wildlife habitat due to construction of Project features, other effects on special status wildlife resulting from Variation 1 could include displacement or disturbance of special status wildlife populations due to noise and human presence during Project construction and maintenance activities. Disruption of species behavioral patterns and an increase in physiological stress from construction noise and activity or routine inspections and maintenance activities also could occur. Noise associated with Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 1. The total area (in acres) that potentially could be affected by increased noise levels of more than 10 dBA within 1 mile of Variation 1 is displayed in Table G-8. On lands under NPS jurisdiction, a total of 69 acres potentially could be affected by increased noise levels. However, the area under NPS jurisdiction that potentially could be affected by increased noise levels is Deerlodge Road. Special status wildlife resources that cross Deerlodge Road likely already experience some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance due to noise and human presence is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Project maintenance activities would include inspection of the transmission line three times annually; other maintenance and repairs would occur on an as-needed basis. In addition, seasonal restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied during times that special status wildlife are most sensitive or use specific seasonal habitats, further reducing the potentially effects of displacement or disturbance due to noise and human presence.

Variation 1 is anticipated to have less impact on special status populations than Alternative WYCO-B because there is already significant human disturbance in the vicinity of the highway and existing transmission lines adjacent to U.S. Highway 40 (CPW 2013). Local special status wildlife populations may already be tolerant of, or have adapted to some level of anthropogenic disturbance because special status wildlife habitats are located in an area of existing disturbance. Furthermore, the CPW considers sage-grouse habitats north of U.S. Highway 40 to be of lower value and importance than habitat south of U.S. Highway 40 (CPW 2013).

The amount of sage-grouse priority habitat and habitat within 4 miles of leks in priority habitat that would be disturbed by Variation 1 would be greater than Variation 2 and less than Alternative WYCO-B (Table G-15). However, sage-grouse habitat north of U.S. Highway 40 is constrained geographically by Cross Mountain and the Yampa River, agricultural conversion of sage-grouse habitats, and the presence of pinyon-juniper woodlands, which may restrict or preclude sage-grouse occupancy of available habitat (CPW 2013).

TABLE G-15
ROUTE VARIATION COMPARISON FOR SPECIAL STATUS WILDLIFE (ACRES)

		Greater Sage-grouse				
Route Variation	**Total Ground Disturbance (acres)**[1]	**Priority Habitat**	**Habitat within 4 miles of Leks located in Priority Habitat**	**General Habitat**	**White-tailed Prairie Dog Potential Colony**	**Mountain Plover Potential Habitat**
Alternative WYCO-B	99	26	43	73	11	5
BLM-administered land	*32*	*23*	*17*	*9*	*3*	*0*
Private land	*67*	*3*	*26*	*64*	*8*	*5*
NPS-jurisdiction crossing (Variation 1)	94	39	49	55	0	4
NPS-administered land[2]	–	–	–	–	–	–
BLM-administered land	*3*	*3*	*0*	0	*0*	*1*
Private land	*89*	*36*	*49*	53	*0*	*3*
State-parcel crossing (Variation 2)	119	56	53	14	0	0
BLM-administered land	*26*	*3*	*0*	0	*0*	*0*
State-administered land	*15*	*0*	*3*	3	*0*	*0*
Private land	*77*	*53*	*50*	11	*0*	*0*

NOTES:

[1] Refers to ground disturbance due to construction of Project features.

[2] No disturbance to special status wildlife habitats on NPS-administered lands are anticipated as all lands under NPS-jurisdiction would be spanned by the Project.

BLM = Bureau of Land Management
NPS = National Park Service

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of selective mitigation measures are described in Section 3.2.8.4.

State-parcel Crossing of Deerlodge Road –Variation 2 (Links C94 and C95)

Based on the impact assessment criteria used in this analysis (refer to Table 3-103 in Section 3.2.8.4.3), residual impacts on special status wildlife and their potential habitats crossed by Variation 2 would be high in areas where special status wildlife habitats are crossed. In areas along Variation 2 that do not cross special status wildlife habitats, no residual impacts were identified using the EIS methods of analysis (Table G-14). High residual impacts on special status wildlife resources would be due to impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. Impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats are considered high because these habitat types are considered the most important areas for maintaining individual and statewide sage-grouse populations. While selective mitigation measures (refer to Table 3-104 in Section 3.2.8.4.3) would minimize the potential effects of direct mortality and increased disturbance on sage-grouse, the presence of transmission lines and structures in sage-grouse habitat may increase susceptibility to predation, and habitat fragmentation and displacement are likely to occur due to the tendency of sage-grouse to avoid areas that contain tall structures (refer to Section 3.2.8.4.3 for detailed descriptions of potential effects of the Project on sage-grouse and other special status wildlife species).

High residual impacts from Variation 2 on special status wildlife would be greater than the other two routing options primarily as a result of its longer length. The types of potential effects on special status wildlife that could occur under all alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.8.

Variation 2 is anticipated to result in 119 acres of total ground disturbance due to construction of Project features. Of the 119 acres of total ground disturbance, 86 acres would consist of temporary disturbance and 33 acres would consist of permanent disturbance. All areas subject to temporary disturbance would be revegetated in accordance with the Project's Reclamation, Revegetation, and Monitoring Plan Framework of the POD. The estimated amount of ground disturbance (in acres) on special status wildlife habitats due to construction of Project features by Variation 2 is presented in Table G-10. Ground disturbance in these habitats associated with Variation 2 would not occur on lands administered by the NPS. Variation 2 does not cross any areas under NPS jurisdiction.

In addition to ground disturbance in special status wildlife habitat due to construction of Project features, other effects on special status wildlife resulting from Variation 2 could include displacement or disturbance of special status wildlife populations due to noise and human presence during Project construction and maintenance activities. Noise associated with Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 2. The total area (in acres) that potentially could be affected by increased noise levels of more than 10 dBA within 1 mile of Variation 2 is displayed in Table G-8. On lands under NPS jurisdiction, a total of 110 acres potentially could be affected by increased noise levels. However, the area under NPS jurisdiction that potentially could be affected by increased noise levels is Deerlodge Road. Special status wildlife that cross Deerlodge Road likely already experiences some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance due to noise and human presence is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Project maintenance activities would include inspection of the transmission line three times annually; other maintenance and repairs would occur on an as-needed basis. In addition, seasonal restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied during times that special status wildlife are most sensitive or use specific seasonal habitats, further reducing the potential effects of displacement or disturbance due to noise and human presence.

The CPW considers sage-grouse habitats north of U.S. Highway 40 to be of lower value and importance than habitat south of U.S. Highway 40 (CPW 2013). However, special status wildlife habitat that would be affected by Variation 2 is relatively undisturbed compared to the other two routing options. Although Link C94 parallels U.S. Highway 40 in an area dominated by big sagebrush and crested wheatgrass, Link C95 is relatively undisturbed in terms of its landscape position and native plant species composition. A large portion of Link C95 is located in an area without other major disturbance such as major roads or other transmission lines. Vegetation in this area appears to be characterized by greater native plant species diversity and less disturbed by historic wildfires than links association with the other route variations (Section 3.2.5).

Impacts on sage-grouse associated with Variation 2 occur outside of existing utility corridors and in areas not substantially altered by previous anthropogenic development activities. The amount of sage-grouse priority habitat and habitat within 4 miles of leks in priority habitat that would be disturbed by Variation 2 also would be greater than Variation 1 and Alternative WYCO-B (Table G-15). However, sage-grouse habitat north of U.S. Highway 40 is constrained geographically by Cross Mountain and the Yampa River, agricultural conversion of sage-grouse habitats, and the presence of pinyon-juniper woodlands, which may restrict or preclude sage-grouse occupancy of available habitat (CPW 2013).

Raptor nest surveys would be conducted prior to construction to identify any active nests that could be affected by construction of the Project. Design Features 3 and 8 (Table 2-8) and species-specific seasonal and spatial restrictions on construction and maintenance activities (Selective Mitigation Measure 12) would be applied to protect nesting raptors in the Project area. The potential residual effects on nesting raptors that could occur after application of selective mitigation measures are described in Section 3.2.8.4.

G.5.7.4 Summary

All three of the routing options cross similar amounts of special status wildlife habitats and would have similar types of impacts. Additionally, potential impacts on special status wildlife could be reduced through implementation of Project design features for environmental protection (Table 2-8) and selective mitigation measures (Table 2-13) for all routing options. Differences in impacts on special status wildlife resources among the three options are driven largely by the landscape position of the routing options relative to other existing disturbances and differences in the special status wildlife species that may be affected.

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B is located south of U.S. Highway 40 and colocated with two existing transmission lines through the Tuttle Ranch Conservation Easement. White-tailed prairie dog potential colonies, mountain plover potential habitat, and greater sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks in priority habitats would be crossed by Alternative WYCO-B. Residual impacts on special status wildlife would consist mostly of high impacts due to impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats. The presence of transmission lines and structures in sage-grouse habitat may increase susceptibility to predation, and habitat fragmentation and displacement are likely to occur due to the tendency of sage-grouse to avoid areas that contain tall structures.

Loss of special status wildlife habitats associated with Alternative WYCO-B would not occur on lands administered by the NPS as Alternative WYCO-B does not cross any areas under NPS jurisdiction. Temporary displacement or disturbance to special status wildlife species are not anticipated to occur on lands under NPS jurisdiction as a result of increased noise associated with Project construction activities.

Alternative WYCO-B is located approximately 8 miles from Dinosaur National Monument and could indirectly affect wide-ranging special status wildlife populations in Dinosaur National Monument if habitat loss, mortality, displacement or disturbance resulting from Project activities on other jurisdictions prevents movement of individuals that would otherwise use habitats in Dinosaur National Monument. However, these effects are anticipated to be minimal as a result of seasonal restrictions on construction and maintenance activities that would be applied during times that special status wildlife are most sensitive or use specific seasonal habitats. In addition, Alternative WYCO-B is not anticipated to present a significant additional barrier to wildlife movement. Alternative WYCO-B is located primarily in a designated utility corridor and adjacent to linear disturbances including U.S. Highway 40 and an existing high-voltage transmission line.

Alternative WYCO-B would result in fewer miles of high residual impacts than Variation 1 or Variation 2 (Table G-14) because fewer miles of sage-grouse priority habitat or habitat within 4 miles of leks in priority habitat are crossed. Existing linear disturbances including U.S. Highway 40 and a high-voltage transmission line have degraded the quality of sage-grouse habitats. Locating the transmission line in previously disturbed habitats and adjacent to existing linear infrastructure would minimize sage-grouse habitat loss and fragmentation. However, the CPW considers sage-grouse and white-tailed prairie dog habitats south of U.S. Highway 40 to be of higher value than habitats north of U.S. Highway 40 (CPW 2013). Locating additional transmission lines across the Tuttle Ranch Conservation Easement would expand the existing disturbed area and impact more potentially high quality habitat for special status wildlife resources. Alternative WYCO-B also is the only routing option that would affect white-tailed prairie dog potential colonies (Table G-10).

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located adjacent to but north of U.S. Highway 40 and crosses the Deerlodge Road in an area under NPS jurisdiction. Mountain plover potential habitat, and greater sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks in priority habitats are crossed by Variation 1. Residual impacts on special status wildlife would consist mostly of high impacts due to impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats (Table G-12). Impacts in these habitat types are considered high because they are considered the most important areas for maintaining individual and statewide sage-grouse populations. The presence of transmission lines and structures in sage-grouse habitat may increase susceptibility to predation, and habitat fragmentation and displacement are likely to occur due to the tendency of sage-grouse to avoid areas that have tall structures.

Loss of special status wildlife habitats associated with Variation 1 would not occur on lands administered by the NPS as Variation 1 would span the area of Deerlodge Road under NPS jurisdiction. Temporary displacement or disturbance to special status wildlife species could occur on lands under NPS jurisdiction as a result of increased noise associated with Project construction activities. Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 1 and could affect a total of 69 acres on lands under NPS jurisdiction. However, the area under NPS jurisdiction that could potentially be affected by increased noise levels is Deerlodge Road. Special status wildlife that cross Deerlodge Road likely already experiences some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance from special status wildlife habitats due to construction noise is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years. Special status wildlife mortality associated with bird transmission line collisions, or mammal and reptile collisions with Project construction equipment or vehicles, could occur along Deerlodge Road on lands under NPS-jurisdiction. This potential effect is likely to be minimal as the area crossed under NPS jurisdiction is limited to the width of Deerlodge Road.

Variation 1 is located approximately 8 miles from Dinosaur National Monument and could indirectly affect wide-ranging special status wildlife populations in Dinosaur National Monument if habitat loss, mortality, displacement or disturbance resulting from Project activities prevents movement of individuals that would otherwise use habitats in Dinosaur National Monument. However, these effects are anticipated to be minimal as a result of seasonal restrictions on construction and maintenance activities that would be applied during times that special status wildlife are most sensitive or use specific seasonal habitats. In addition, Variation 1 is not anticipated to present a significant additional barrier to wildlife movement. The route would follow the Highway 40 corridor and be concentrated with other development and human disturbance associated with the highway and residences, including existing transmission lines.

The length of Variation 1 is the same as Alternative WYCO-B; therefore, the residual impacts and overall amount of disturbance to special status wildlife habitats are similar to Alternative WYCO-B. However, Variation 1 is anticipated to have less impact on special status wildlife populations than Alternative WYCO-B because there is already significant human disturbance in the vicinity of the highway and existing transmission lines adjacent to U.S. Highway 40. Furthermore, the CPW considers sage-grouse habitats north of U.S. Highway 40 to be of lower value and importance for sage-grouse than habitat south of U.S. Highway 40 (CPW 2013).

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and would cross Deerlodge Road on lands administered by the State of Colorado. Greater sage-grouse priority habitats, general habitats, and habitats within 4 miles of leks in priority habitats are crossed by Variation 2. Residual impacts on special status wildlife would consist mostly of high impacts due to impacts on sage-grouse priority habitats and habitats within 4 miles of leks located in priority habitats (Table G-12). Impacts in these habitat types are considered high because they are considered the most important areas for maintaining individual and statewide sage-grouse populations. The presence of transmission lines and structures in sage-grouse habitat may increase susceptibility to predation, and habitat fragmentation and displacement are likely to occur due to the tendency of sage-grouse to avoid areas that contain tall structures.

Loss of special status wildlife habitats associated with Variation 2 would not occur on lands administered by the NPS as Variation 2 does not cross any areas under NPS jurisdiction. Temporary displacement or disturbance to special status wildlife species could occur on lands under NPS jurisdiction as a result of increased noise associated with Project construction activities. Project construction activities are anticipated to increase ambient noise levels more than 10 dBA up to 1 mile from Variation 1 and could affect a total of 110 acres on lands under NPS jurisdiction. However, the area under NPS jurisdiction that potentially could be affected by increased noise levels is Deerlodge Road. Special status wildlife that cross Deerlodge Road likely already experiences some adverse effects from increased noise levels and human disturbance associated with Deerlodge Road. Additional displacement or disturbance from special status wildlife habitats due to construction noise is likely to be temporary as the majority of Project construction activities are anticipated to be completed within 2 years.

Variation 2 is located approximately 6 miles from Dinosaur National Monument and could indirectly affect wide-ranging special status wildlife populations in Dinosaur National Monument if habitat loss, mortality, displacement or disturbance resulting from Project activities on other jurisdictions prevents movement of individuals that would otherwise use habitats in Dinosaur National Monument. However, these effects are anticipated to be minimal as a result of seasonal restrictions on construction and maintenance activities that would be applied during times that special status wildlife are most sensitive or use specific seasonal habitats.

The length of Variation 2 is longer than Variation 1 and the route of Alternative WYCO-B and therefore would result in greater residual impacts and disturbance to special status wildlife habitats than Variation 1 and Alternative WYCO-B (Table G-14 and Table G-15). Variation 2 would result in an additional parallel disturbance to special status wildlife resources within a relatively short distance because the majority of the route would not be contiguous with other existing parallel disturbances (i.e., U.S. Highway 40 or the existing transmission line corridor). However, the CPW considers sage-grouse habitats north of U.S. Highway 40 to be of lower value than sage-grouse habitats south of U.S. Highway 40 (CPW 2013).

G.5.8 Fish and Aquatic Resources

This section describes the existing condition of fish and aquatic species, including special status fish and aquatic species and analyzes the potential effects on these resources that could result from construction, operation, and maintenance of the Project in the vicinity of the Dinosaur National Monument Deerlodge Road. This analysis tiers to the broader assessment in Section 3.2.10. Special status fish and aquatic species are those federally listed as either endangered, threatened, or candidates for protection under the ESA or those considered sensitive by the BLM and/or state. The NPS Dinosaur National Monument does not maintain an agency-specific list of special status fish and aquatic species, but considers species managed by FWS, BLM, and the State of Colorado in the decision-making process.

The resource inventory and impact levels associated with the three routing options are presented on Map G-6 and G-9 at the end of this appendix.

G.5.8.1 Local Setting

The three routing options addressed in this document are located in the Colorado Plateau Ecoregion, as adapted from *North American Terrestrial Ecoregions—Level III* (Commission for Environmental Cooperation 2011) and the Twelvemile Gulch catchment basin, which flows into the Yampa River as part of the Lower Yampa Subbasin near Cross Mountain (refer to Section 3.2.5).

Aquatic habitats identified in the study corridors include a mixture of streams, ponds, springs, wetlands, and riparian areas that support or have the potential to support aquatic species. These water resources can be grouped into three habitat categories for this analysis: lentic habitats, lotic habitats, and wetland habitats. Lentic and lotic habitats considered in this analysis were derived from the National Hydrography Dataset (NHD) (USGS 2010a). Wetland habitats considered in this analysis consist of a combination of the National Wetlands Inventory (FWS 2012a) and the Southwest Regional GAP land-cover category (SWReGAP) dataset (USGS 2010c). Aquatic habitat types are described in detail in Section 3.2.10.

Aquatic habitats in the study corridors for the routing options addressed in this document are limited. There are two named drainages crossed by the three routing options: (1) Twelvemile Gulch, an intermittent stream that supports wetland vegetation in some areas and (2) Mud Springs Gulch, an intermittent drainage, which does not support wetland vegetation and is a tributary to Twelvemile Gulch. Primarily, aquatic habitat in Twelvemile Gulch is classified North American arid west emergent marsh. The dominant terrestrial habitat adjacent to aquatic habitats consists of Intermountain Sagebrush Shrubland and Steppe. Refer to Appendix J for detailed descriptions of land-cover categories.

Fish species with the potential to occur in the study corridors require a perennial source of water for all or most of their life. Therefore, this analysis assumes that the streams in the route variation study corridor do not directly support fish species. However, intermittent streams could provide habitats for amphibians and invertebrates and Twelvemile Gulch is a tributary to the Yampa River.

The Yampa River is one of the only remaining free-flowing rivers in western Colorado that has not been affected by major dams or water diversions. The river contains designated critical habitat for four federally listed fish species including the bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius,)* razorback sucker (*Xyrauchen texanus*), and humpback chub (*Gila cypha*). Nine BLM and/or state-listed special status fish and amphibian species may occur in association with the Yampa River. Some of these amphibians could occur in wetland habitats associated with Twelvemile Gulch. BLM and/or state-listed special status fish species include the Colorado River cutthroat trout (*Oncorhynchus clarkii pleuriticus*) (unlikely resident of the lower Yampa River), bluehead sucker (*Castostomus discobolus*), flannelmouth sucker (*C. latipinnis*), mountain sucker (*C. platyrhynchus*), plains topminnow (*Fundulus sciadicus*), and roundtail chub (*Gila robusta*). BLM and/or state-listed amphibian species include the boreal western toad (*Bufo boreas boreas*), Great Basin spadefoot toad (*Spea intermontana),* and northern leopard frog (*Rana pipiens*). Refer to Section 3.2.10.4.1 for detailed information regarding fish and aquatic resources inventory.

G.5.8.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B is located south of U.S. Highway 40 and colocated with an existing 345kV transmission line. The routing option crosses through the Tuttle Ranch Conservation Easement. The routing option makes a total of nine crossings of intermittent streams including but not limited to:

- Three crossings of unnamed tributaries to Mud Springs Gulch in an area with no visible aquatic or riparian habitats, and
- Four crossings of unnamed tributaries to Twelvemile Gulch, two of which are located within 500 feet of small areas of visible wetland vegetation.

Wetland habitats crossed near Alternative WYCO-B are classified as North American arid west emergent marsh. These potential wetlands are located on private property and were not accessible to be visited during the field visit. Based on an interpretation of aerial photography in the area, the wetlands crossed appear to be relatively isolated and it is anticipated that they do not directly support special status fish or other aquatic species. No wetland or aquatic habitats are crossed by this routing option on NPS-administered lands.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located north of U.S. Highway 40 and crosses the Deerlodge Road in an area under NPS jurisdiction. Variation 1 makes a total of 12 crossings of intermittent streams including but not limited to:

- One crossing of Mud Springs Gulch in an area with no visible aquatic or riparian habitats;
- One crossing of an unnamed tributary to Mud Springs Gulch in an area with no visible aquatic or riparian habitats;
- One crossing of Twelvemile Gulch in a location with no visible aquatic or riparian habitats; and
- Two crossings of an unnamed tributary to Twelvemile Gulch with small areas of visible wetland vegetation.

Additionally, Variation 1 is parallel to and located within 500 feet of the unnamed tributary to Twelvemile Gulch for approximately 0.5 mile. The unnamed tributary appears to support wetland vegetation in this area. Wetland habitats crossed by Variation 1 are classified as North American arid west emergent marsh. These potential wetlands are located on private property and were not accessible to be visited during the field visit.

No wetland or aquatic habitats are crossed by Variation 1 on NPS-administered lands. Based on an interpretation of aerial photography in the area, the wetlands crossed appear to be relatively isolated and it is anticipated that they do not directly support special status fish or other aquatic species.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and crosses the Deerlodge Road on lands administered by the State of Colorado. The Variation 2 makes a total of 13 crossings of intermittent streams including but not limited to:

- One crossing of Mud Springs Gulch in an area with no visible aquatic or riparian habitats;
- One crossing of an unnamed tributary to Mud Springs Gulch in an area with no visible aquatic or riparian habitats;
- One crossing of Twelvemile Gulch in a location with small areas of visible wetland vegetation; and
- Two crossings of unnamed tributaries to Twelvemile Gulch with no visible aquatic or riparian habitats.

Wetland habitats crossed by Variation 2 are classified as North American arid west emergent marsh. These potential wetlands are located on lands administered by the State of Colorado and were visited during the field visit (refer to Section G.5.4). It is anticipated that they do not directly support special status fish or other aquatic species. No wetland or aquatic habitats are crossed by Variation 2 on NPS-administered lands.

G.5.8.3 Environmental Consequences

All routing options addressed are located in the Twelvemile Gulch catchment basin, which flows into the Yampa River. The river contains designated critical habitat for four federally listed fish species. As described in Section 3.2.10, all alternatives would implement measures to avoid and minimize the Project's potential effects on waterbodies and water quality. The Applicant has committed to procuring all water used for the Project from municipal sources, commercial sources, or under a temporary water-use agreement with landowners holding existing water rights and no water would be drafted from the Yampa River. Therefore, it is anticipated that all three routing options would have the same effect on the Yampa River and resources associated with the river, including designated critical habitat. These effects are anticipated to be minimal or undetectable.

Alternative WYCO-B (Links C92, C171, C173, and C174)

The types of potential effects on fish and aquatic resources that could occur under all Project-wide alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.10. The methodology used to assess potential impacts on fish and aquatic resources for the purpose of interdisciplinary comparison of alternative routes in the EIS did not identify any potential impacts on fish or aquatic resources located near the Alternative WYCO-B study corridor.

However, Alternative WYCO-B would require nine crossings of intermittent or ephemeral drainages and would be located within 500 feet of visible wetland vegetation in two areas where the route crosses drainages that contain wetland vegetation. These aquatic habitats may support amphibians and invertebrates. Potential effects on these resources and measures that could be used to reduce these impacts are described in detail in Section 3.2.10. After application of mitigation measures, it is not anticipated that aquatic habitats crossed by the routing option would be directly affected by Project activities.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

The types of potential effects on fish and aquatic resources that could occur under all Project-wide alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.10. The methodology used to assess potential impacts on fish and aquatic resources for the purpose of interdisciplinary comparison of alternative routes in the EIS did not identify any potential impacts on fish or aquatic resources located near the Variation 1 study corridor.

However, Variation 1 would require 12 crossings of intermittent drainages and would be located within 500 feet of visible wetland vegetation for approximately 0.5 mile. These aquatic habitats may support amphibians and invertebrates. Potential effects on these resources and measures that could be used to reduce these impacts are described in detail in Section 3.2.10. After application of mitigation measures, it is not anticipated that aquatic habitats crossed by the route would be directly affected by Project activities such as cut and fill.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

The types of potential effects on fish and aquatic resources that could occur under all Project-wide alternative routes and the degree to which these effects would be mitigated or avoided are described in detail in Section 3.2.10. The methodology used to assess potential impacts on fish and aquatic resources for the purpose of interdisciplinary comparison of alternative routes in the EIS did not identify any potential impacts on fish or aquatic resources located near the Variation 2 study corridor.

However, Variation 2 would require 13 crossings of intermittent or ephemeral drainages and would be located within 500 feet of visible wetland vegetation in one area where the route crosses a drainage that contains wetland vegetation. These aquatic habitats may support amphibians and invertebrates. Potential effects on these resources and measures that could be used to reduce these impacts are described in detail in Section 3.2.10. After application of mitigation measures, it is not anticipated that aquatic habitats crossed by the route would be directly affected by Project activities.

G.5.8.4 Summary

All route variations would have the same minor-to-undetectable effects on the Yampa River and associated designated critical habitats.

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B is located south of U.S. Highway 40 and colocated with an existing 345kV transmission line. The routing option crosses through the Tuttle Ranch Conservation Easement. Alternative WYCO-B makes nine crossings of intermittent or ephemeral drainages. Two of these crossings are within 500 feet of locations that support visible wetland vegetation. These features are not known to support sensitive species, but may support invertebrates or amphibians. After application of mitigation measures, it is not anticipated that aquatic habitats crossed by the route would be directly affected by Project activities such as cut and fill.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C93 and C94)

Variation 1 is located north of U.S. Highway 40 and crosses the Deerlodge Road in an area under NPS jurisdiction. Variation 1 makes 12 crossings of intermittent drainages. Two of these crossings are in locations that support visible wetland vegetation. Variation 1 also is within 500 feet of an unnamed drainage that supports wetland vegetation for longer than any of the other route variations. These features are not known to support sensitive species, but may support invertebrates or amphibians. After application of mitigation measures, it is not anticipated that aquatic habitats crossed by the route would be directly affected by Project activities such as cut and fill.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 is located north of U.S. Highway 40 and crosses the Deerlodge Road on lands administered by the State of Colorado. Variation 2 makes 13 crossings of intermittent drainages. One of these crossings is within 500 feet of a location that supports visible wetland vegetation. This feature is not known to support sensitive species, but may support invertebrates or amphibians. After application of mitigation measures, it is not anticipated that aquatic habitats crossed by the route would be directly affected by Project activities such as cut and fill.

G.5.9 Land Use Resources

G.5.9.1 Local Setting

The area consists mainly of open, rolling topography with some rural development. Although the majority of the land has been leased for grazing or oil and/or gas development, there are a few existing residential properties located near the Deerlodge Road.

The resource inventory and impact levels associated with the three routing options are presented on Maps G-11 through G-14 at the end of this appendix.

G.5.9.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

Existing Land Use

The route of Alternative WYCO-B crosses grazing lands but no other existing land uses. This routing option parallels the Bears Ears to Bonanza 345kV transmission line and the Hayden to Artesia 138kV transmission line. There is a communication facility within the 2-mile-wide study corridor of this routing option.

Authorized Land Use

The route of Alternative WYCO-B does not cross any authorized projects nor are there any authorized projects within the 2-mile-wide study corridor of this routing option.

Future Land Use

The route of Alternative WYCO-B parallels the proposed route of the TransWest Express transmission line for the entire length of this routing option. There are no other future facilities planned at this time within the 2-mile-wide study corridor of this routing option.

Planned Land Use

The route of Alternative WYCO-B crosses the Moffat County agriculture general zone. There are no other Moffat County general zones that the Project crosses nor are there any areas of general zone within the 2-mile-wide study corridor of this routing option.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Existing Land Use

Variation 1 crosses grazing lands, but no other existing land uses. There are two residential properties within the 2-mile-wide study corridor of Variation 1.

Authorized Land Use

Variation 1 does not cross an authorized development and there are no other authorized projects in the 2-mile-wide study corridor of Variation 1.

Future Land Use

Variation 1 parallels the proposed route of the TransWest Express transmission line for the majority of the length of this Variation 1. There are no other future facilities planned at this time within the 2-mile-wide study corridor of Variation 1.

Planned Land Use

Variation 1 crosses the Moffat County agriculture general zone. There are no other general zones that Variation 1 crosses nor are there any general zones within the 2-mile-wide study corridor of Variation 1.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Existing Land Use

Variation 2 crosses grazing lands, but no other existing land uses; however, there is a residential property that would be within the Project right-of-way. There is an additional residential property and agricultural lands within the 2-mile-wide study corridor of Variation 2.

Authorized Land Use

Variation 2 crosses an authorized oil and/or gas development at Link C95; no other authorized projects are within the 2-mile-wide study corridor of Variation 2.

Future Land Use

Variation 2 parallels the route of the proposed TransWest Express transmission line for the majority of the length of Variation 2. There are no other future facilities planned at this time within the 2-mile-wide study corridor of Variation 2.

Planned Land Use

Variation 2 crosses the Moffat County agriculture general zone. There are no other Moffat County general zones that Variation 2 crosses nor are there any general zones within the 2-mile-wide study corridor of Variation 2.

G.5.9.3 Environmental Consequences

Alternative WYCO-B (Links C92, C171, C173, and C174)

Existing Land Use

No residual impacts on existing land uses have been identified along the route of Alternative WYCO-B. The centerline of the proposed transmission line parallels the Bears Ears to Bonanza 345kV and the Hayden to Artesia 138kV transmission lines; however, the proposed transmission line would be sited to avoid affecting these two existing transmission lines and their rights-of-way.

Authorized Land Use

No residual impacts on authorized land uses have been identified along the route of Alternative WYCO-B.

Future Land Use

No identifiable residual impacts on future land uses are anticipated along Alternative WYCO-B. This routing options parallels the proposed route of the TransWest Express transmission line for majority of the length of this routing option; however, potential colocation of these two proposed transmission-line projects has been evaluated and the projects would be compatible from a land-use perspective.

Planned Land Use

The route of Alternative WYCO-B crosses the Moffat County agriculture general zone, requiring a conditional use permit for the Project to be located on these lands managed by Moffat County.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Existing Land Use

No high or moderate residual impacts on existing land uses are anticipated along Variation 1; however, the centerline of Variation 1 crosses grazing lands. The Project would be sited to mitigate of avoid affecting grazing infrastructure (e.g., water tanks, fencing); areas disturbed during construction would be reclaimed.

It should be noted though that the NPS Director's Order No. 53, directs that the NPS can issue a right-of-way grant only "…if there is no practicable alternative to such use of NPS lands." The proposed transmission line would span Deerlodge Road, so no permanent infrastructure would affect the NPS road. However, the effects of habitat disruption from construction and visual impairment and noise from the construction and presence of the transmission may have long-term cumulative impacts and are evaluated in the applicable section of this appendix.

Authorized Land Use

No identifiable residual impacts on authorized land uses have been identified along Variation 1.

Future Land Use

Variation 1 parallels the proposed route of the TransWest Express transmission line for majority of the length of this routing option; however, potential colocation of these two proposed transmission-line projects has been evaluated and the projects would be compatible from a land-use perspective.

Planned Land Use

Variation 1 crosses the Moffat County agriculture general zone, requiring a conditional use permit for the Project to be located on these lands managed by Moffat County.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Existing Land Use

Variation 2 crosses 0.2 mile of moderate residual impacts on residential property within 250 feet of the proposed centerline. There are no high residual impacts on existing land use. Impacts on residential property would be mitigated through tower placement and spanning sensitive features.

Authorized Land Use

There would be no high or moderate residual impacts on authorized land uses; however, there would be 1.0 mile of low residual impacts on authorized oil and/or gas developments crossed by the Variation 2. The Project would be sited to avoid crossing extraction sites.

Future Land Use

Variation 2 parallels the proposed route of the TransWest Express transmission line for the majority of the length of Variation 2; however, potential colocation of these two proposed transmission-line projects has been evaluated and the projects would be compatible from a land-use perspective.

Planned Land Use

Variation 2 crosses the Moffat County agriculture general zone, requiring a conditional use permit for the Project to be located on these lands managed by Moffat County.

G.5.9.4 Summary

For all three routing options, impacts on existing, authorized, future, and planned land uses would be mitigated to the greatest extent practicable. The majority of impacts on existing land uses would be on grazing lands, where Variation 1 would cross near an existing residential property. The effects on authorized, future, and planned land uses would be minimal.

As noted previously in this section, the NPS Director's Order #53, directs that the NPS can issue a right-of-way grant only "…if there is no practicable alternative to such use of NPS lands." The Project would span Deerlodge Road, so no permanent infrastructure would affect the NPS road. However, the effects of habitat disruption from construction, visual impairment and noise from construction and from presence of the transmission line may have long-term cumulative impacts and are evaluated in the applicable sections of this appendix.

G.5.10 Parks, Preservation, and Recreation Resources

The resource inventory and impact levels associated with the three routing options are presented on Map G-15 at the end of this appendix.

G.5.10.1 Local Setting

Dinosaur National Monument is the major recreation opportunity in this area; recreation activities occur in and around the monument. Deerlodge Road provides access to the monument's recreation areas including trails, camp sites, and access to the Green River.

G.5.10.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B crosses at Link C174 and there is Semi-Primitive Motorized /Front/Middle Country recreation opportunity spectrum area managed by the BLM Little Snake Field Office within the 2-mile-wide study corridor of Alternative WYCO-B.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Variation 1 crosses at Link C93 and there is Semi-Primitive Motorized /Front/Middle Country recreation opportunity spectrum area managed by the BLM Little Snake Field Office within the 2-mile-wide study corridor of Variation 1. As discussed in Section 3.2.12, attendance at Dinosaur National Monument has declined between 2013 and 2014, but the use of Deerlodge Road has increased. Recreation users use the kiosk at the entrance of the monument located on Deerlodge Road to identify recreation areas such as camp sites, river access points, and trails farther inside the Monument.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 crosses at Link C95 and there is Semi-Primitive Motorized /Front/Middle Country recreation opportunity spectrum area managed by the BLM Little Snake Field Office in the 2-mile-wide study corridor of Variation 1. As discussed in Section 3.2.12, attendance at Dinosaur National Monument has declined between 2013 and 2014, but the use of Deerlodge Road has increased. Recreation users use the kiosk located at the entrance of Deerlodge Road to identify recreation areas such as camp sites, river access points, and trails farther inside the Monument.

G.5.10.3 Environmental Consequences

Impacts Common to All Action Alternatives

There are no residual impacts on parks, preservation, or recreation resources identified along any of the three routing options. The Semi-Primitive Motorized /Front/Middle Country recreation opportunity spectrum area that the three routing options cross does not restrict the development of utilities. Specific construction and maintenance impacts on recreation resources are discussed under the discussion for each routing option.

Alternative WYCO-B (Links C92, C171, C173, and C174)

Along the route of Alternative WYCO-B, would be no short or long-term impacts on the recreation resources in and around Dinosaur National Monument.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

The proposed transmission line would span Deerlodge Road, so no permanent infrastructure would affect the NPS road. Short-term impacts on recreation resources may result from closed or restricted access to recreation sites and noise from machinery on Deerlodge Road during construction of the Project. Wildlife may be affected temporarily. Long-term effects on recreation resources could include habitat disruption from construction and visual impairment and noise from during construction and from presence of the proposed transmission line. These effects are evaluated further in the applicable sections of this appendix.

It should be noted though that the NPS Director's Order No. 53, directs that the NPS can issue a right-of-way grant only "…if there is no practicable alternative to such use of NPS lands."

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

The proposed transmission line would span (Deerlodge Road, so no permanent infrastructure would affect the NPS road. Short-term impacts on recreation resources may result from closed or restricted access to recreation sites and noise from machinery on Deerlodge Road during construction of the Project. Wildlife may be affected temporarily. Long-term effects on recreation resources could include habitat disruption from construction and visual impairment and noise during construction and from presence of the transmission line. These effects are evaluated further in the applicable sections of this appendix.

It should be noted though that the NPS Director's Order No. 53, directs that the NPS can issue a right-of-way grant only "…if there is no practicable alternative to such use of NPS lands."

G.5.10.4 Summary

Effects on parks, preservation, and recreation resources would be minimal. Because of the presence of the existing transmission lines, the Tuttle Ranch Conservation Easement variation would have fewer impacts on Dinosaur National Monument. No recreation sites on Deerlodge Road would be directly affected; visual impacts on recreation users are discussed in Section 3.2.18.

As stated previously in this section, the NPS Director's Order No. 53, directs that the NPS can issue a right-of-way grant only "…if there is no practicable alternative to such use of NPS lands." The proposed transmission line would span Deerlodge Road, so no permanent infrastructure would affect the NPS road. However, the effects of habitat disruption from construction and visual impairment and noise during construction and from the presence of the transmission may have long-term cumulative impacts and are evaluated in the applicable sections of this appendix.

G.5.11 Congressional Designation, Special Designations and Other Management Areas

The resource inventory and impact levels associated with the three routing options are presented on Map G-16 at the end of this appendix.

G.5.11.1 Local Setting

The only congressional designation located in this area is Dinosaur National Monument. The special designation and other management areas protect habitat for wildlife. These are located east and south of Deerlodge Road in the Dinosaur National Monument.

G.5.11.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B crosses at Link C173 along the Tuttle Ranch Conservation Easement for 3.0 miles, with no other congressional designations, special designations or other management areas within the 2-mile-wide study corridor of Alternative WYCO-B.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Variation 1 crosses Deerlodge Road, owned in fee by the NPS and is part of the Dinosaur National Monument. The proposed transmission line would span Deerlodge Road, so no permanent infrastructure would affect the NPS road.

No other congressional designations, special designations, and other management areas; however, the Tuttle Ranch Conservation Easement is located within the 2-mile-wide study corridor of Variation 1.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 does not congressional designations, special designations, and other management areas; however, the Tuttle Ranch Conservation Easement is located within the 2-mile-wide study corridor of Variation 2.

G.5.11.3 Environmental Consequences

Alternative WYCO-B (Links C92, C171, C173, and C174)

There would be no short or long-term impacts on the recreation resources in and around Dinosaur National Monument in addition to the impacts common to all alternatives.

The route of Alternative WYCO-B crosses 3.0 miles of moderate impacts where Link C173 crosses the Tuttle Ranch Conservation Easement. Terms of the agreement for the Tuttle Ranch Conservation Easement prohibit building or installing any new overhead utilities, including electrical transmission lines, without approval from the State of Colorado. The only effective mitigation would be avoidance in lieu of amending the terms of the agreement.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Variation 1 crosses Deerlodge Road, owned in fee by the NPS and is part of the Dinosaur National Monument. By applying mitigation for a maximum span across Deerlodge Road (Selective Mitigation Measures 7 and 9), direct impacts on the road could be mitigated. A kiosk is located along the north side of Deerlodge Road when turning from Colorado State Highway 40. The kiosk provides information on directions to the Yampa River for rafters, campgrounds, trails, general park information, etc. Recreation-user data for Deerlodge Road and the Dinosaur National Monument is discussed in Section 3. 2.12. Although recreation sites may not be affected by the Project, recreation users experience when using the Deerlodge Road may be affected. The visual effects on recreational users are discussed in Section 3.2.18.

It should be noted though that the NPS Director's Order No. 53, directs that the NPS can issue a right-of-way grant only "…if there is no practicable alternative to such use of NPS lands."

Any applicable National Environmental Policy Act of 1969 (NEPA) and/or cultural resource analysis would need to be completed prior to granting right-of-way. Right-of-way could be granted only if there are no practicable alternatives to such use of NPS lands. Refer to Section 3.2.18 for discussion of visual impacts on Deerlodge Road from the Project.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 crosses no congressional designations, special designations, or other management areas. The proposed transmission line would span Deerlodge Road, so no permanent infrastructure would affect the NPS road. However, during construction, habitat may be disrupted and wildlife may be temporarily affected. Visual impairment and noise during construction and from the presence of the transmission line infrastructure may have long-term cumulative impacts and are evaluated in applicable sections of this appendix. A kiosk is located along the north side of Deerlodge Road when turning from Colorado State Highway 40. The kiosk provides information on directions to the Yampa River for rafters, campgrounds, trails, general park information, etc. Recreation user data for Deerlodge Road and Dinosaur Monument is discussed in Section 3. 2.12. Although recreation sites may not be affected by the Project, recreation users experience when using the Deerlodge Road may be affected if the Project crosses Deerlodge Road. The visual effects on recreational users are discussed in Section 3.2.18. Effects of noise are discussed in Section G.5.16.

G.5.11.4 Summary

Variation 2 is the only variation that would not affect a congressional designation, special designation, or other management area. For the Deerlodge Road crossing, the proposed transmission line would span Deerlodge Road, so no permanent infrastructure would affect the NPS road. However, the effects of habitat disruption during construction, and visual impairment and noise during construction and from the presence of the transmission line may have long-term cumulative impacts and are evaluated in applicable sections of this appendix. Per NPS Director's Order No. 53, which directs that the NPS can issue a right-of-way grant only "if there is no practicable alternative to such use of NPS lands."

G.5.12 Lands with Wilderness Characteristics

The resource inventory and impact levels associated with the three routing options are presented on Map G-17 at the end of this appendix.

G.5.12.1 Local Setting

There are inventoried lands with wilderness characteristics managed by the BLM Little Snake Field Office located to the southeast of Dinosaur National Monument.

G.5.12.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

The Crooked Wash unit (Unit 41) is 13,391 acres and contains many high ridges with pinyon-juniper breaking up the unit with grassland valleys below. The unit is shaped like a large "U" with varying widths. The interior of the unit allows for solitude and opportunities for solitude. A road does cross the left side of the unit. Due to the size of the unit, there are outstanding opportunities of solitude and primitive and unconfined type of recreation, including off-road driving, camping hiking, and wildlife observation, with hunting as the major recreational activity in the unit. This unit was inventoried in 2012; management of the Crooked Wash unit has not been analyzed through a land-use planning process.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Variation 1 does not cross any lands with wilderness characteristics but there are lands with wilderness characteristics located in the 2-mile-wide study corridor of Variation 1.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

The Twelvemile Mesa unit (Unit 38) is 10,238 acres and contains many high ridges with pinyon-juniper breaking up the unit with grassland valleys below. The unit is shaped like a large "U" with varying widths. The interior of the unit allows for naturalness and opportunities for solitude. A road does cross the west side of the unit. Due to the size of the unit, there are outstanding opportunities of solitude and primitive and unconfined type of recreation including off-road driving, camping hiking, and wildlife observation, with hunting as the major recreational activity in the unit. This unit was inventoried in 2012; management of the Crooked Wash unit has not been analyzed through a land-use planning process.

G.5.12.3 Environmental Consequences

Alternative WYCO-B (Links C92, C171, C173, and C174)

The route of Alternative WYCO-B crosses the western portion of the Crooked Wash unit, (removing approximately 20 acres for the Project right-of-way and a portion of the unit to the northeast of the Project). The remaining portion of the unit would still meet the 5,000-acre size requirement, but the northeastern portion would not. Short-term effects from the Project to the naturalness, solitude/unconfined and primitive recreation of the area would be visual, noise, dust, and vehicle emissions from construction activities and equipment as well as potential restrictions on access to the unit. Long-term effects from the Project would be the reduced size of the unit and the influences of the Project infrastructure, including the vertical prominence of transmission structures, on the area's wilderness characteristics. This unit was inventoried in 2012; management of the lands with wilderness characteristics unit has not been analyzed through a land-use planning process.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Variation 1 would not affect any lands with wilderness characteristics.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Variation 2 crosses the eastern portion of the Twelvemile Mesa unit, (removing approximately 45 acres for the Project right-of-way and a portion of the unit to the east of the Project). The western portion of the unit would still meet the 5,000-acre size requirement, but the eastern portion would not. Short-term effects from the Project on the naturalness, solitude/unconfined and primitive recreation of the area would be visual, noise, dust, and vehicle emissions from construction activities and equipment as well as potential restrictions on access to the unit. Long-term effects from the Project would be the reduced size of the unit and the influences of the Project infrastructure, including the vertical prominence of transmission structures, on the area's wilderness characteristics. This unit was in inventoried in 2012; management of the lands with wilderness characteristics unit has not been analyzed through a land-use planning process.

G.5.12.4 Summary

Variation 1 would cross the Twelvemile Mesa unit. The route of Alternative WYCO-B would cross the Crooked Wash unit. The Twelvemile Mesa and Crooked Wash units are managed by the BLM Little Snake Field Office. These units were inventoried in 2012 and have not been through a planning process.

G.5.13 Transportation and Access

G.5.13.1 Local Setting

Federal, state, and local transportation and access facilities and systems are located throughout the Project area, including roadways, airports and aviation facilities, and railroad facilities. Transportation facilities were identified and evaluated for potential impacts from the Project, where transportation facilities were crossed by the routing options. Roadways also were identified for the potential to be used for construction, operation, and maintenance of the Project.

G.5.13.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

Along the route of Alternative WYCO-B, Link C92 crosses U.S. Highway 40 approximately 2 miles northeast of Deerlodge Road.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Along Variation 1, Link C93 crosses Deerlodge Road near its intersection with U.S. Highway 40 and crosses U.S. Highway 40 approximately 2 miles southwest of the intersection. The links also parallels and is in proximity to U.S. Highway 40.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Along Variation 2, Link C95 crosses Deerlodge Road approximately 1.5 miles northwest of its intersection with U.S. Highway 40 and crosses U.S. Highway 40 approximately 2 miles southwest of the intersection. Link C94 also parallels and is in proximity to U.S. Highway 40.

G.5.13.3 Environmental Consequences

Impacts Common to All Action Alternatives

For construction of the transmission line, improvement of existing access and new road construction for the Project would be expected to increase traffic (i.e., the number of daily trips) on the regional roadway network. The increase in daily trips would occur primarily in the mornings and evenings due to construction workers commuting to and from the worksite. Increases in daily trips would be less apparent on existing primary transportation routes (e.g., U.S. Highway 40).

Construction of the Project would be implemented in three distinct construction spreads as described in Section 2.4.6, Construction Elements. Generally, Spread 1 would include construction of the Project in Wyoming and Colorado. Spread 2 would include the eastern portions of Utah, generally from the Utah/Colorado border westward to the Wasatch Plateau. Spread 3 would include the construction of the Project in central Utah.

As discussed in Section 3.2.22.5.1, Spread 1 is anticipated to have the largest peak of workers (263 workers) over a period of 8 months (from months 15 to 22 of a 32-month construction schedule anticipated to conclude in December 2020). The proposed phased approach for construction (refer to Section 2.4.6) would likely require workers/crews to be spread throughout the geographic area of Spread 1. Assuming workers commuting to and from work sites would average 2.5 workers per vehicle, an additional (approximate) 210 daytrips (i.e., 105 morning trips and 105 evening trips) on the existing roadway network would be anticipated during the 8-month construction period. The additional vehicles would be concentrated in the vicinity of the Project right-of-way throughout the Wyoming and Colorado portions of the Project area. Because of the size of the construction spread and existing access available in Wyoming and Colorado, it is not anticipated that the additional daytrips from workers commuting to and from the work site would create significant impacts on the existing roadway network in Wyoming and Colorado.

Increased traffic and/or congestion on the existing roadway network throughout the Project area could occur from slow moving, oversized loads of materials and/or construction equipment being delivered to multi-purpose construction yards. From the multi-purpose construction yards, materials and equipment would be dispersed where needed on the access roads identified and approved in the POD. It is anticipated that the multi-purpose construction yards would be located near existing roadways that can support oversized loads. Also, it is anticipated that congestion would be minimal and safety procedures, to be outlined in the POD (i.e., temporary signage alerting drivers, flaggers, pilot trucks/escorts), would be followed to limit the potential of accidents. The potential for the greatest congestion could occur throughout the Project area in the spring in 2019 through the summer of 2020 (refer to Section 3.2.22.5.1 of Social and Economic Conditions). However, it is anticipated that deliveries and/or the transportation of construction equipment would be staggered during working hours of the work week when congestion on roadways is less likely to occur.

Throughout the life of the Project, the access roads required for the operation and maintenance of the transmission line would need to be maintained in accordance with the Applicant’s and/or agencies’ maintenance standards. Existing access that would be improved to meet the requirements of the Project, could require agencies’ responsible for maintenance of the improved existing access to maintain these roads to a higher standard than maintained previously. New access developed for the Project typically would be done under the assumption that new access would be used by only the Applicant’s personnel for purposes associated with the Project. It is anticipated that these new access roads would be maintained by the Applicant but also would likely need to be incorporated into the agencies’ travel management plans. The new access has the potential to increase access into areas previously inaccessible through unauthorized off-highway vehicle (OHV) use. The unauthorized access would have the potential for additional administrative considerations for agencies (i.e., additional enforcement, signage, disturbance and sensitive features, etc.). Through the application of selective mitigation measures to limit unauthorized access, it is anticipated minimal impact would occur.

G.5.13.4 Summary

Impacts on transportation and access resources are similar for all three routing options.

G.5.14 Visual Resources

The resource inventory and impact levels associated with the three routing options are presented on Maps G-18 through G-21 at the end of this appendix.

G.5.14.1 Local Setting

The landscapes adjacent to the Deerlodge Road entrance of Dinosaur National Monument contain characteristics of both the Wyoming Basin physiographic province and the Uinta Basin section of the Colorado Plateaus physiographic province since they are located at the transitional area between these provinces. The windswept rolling steep and hogback ridges of the Wyoming Basin become more dissected, display a greater diversity of soil colors, and show an increased density of pinyon-juniper vegetation.

Unlike the portion of the Uinta Basin physiographic section farther to the west, this area contains limited industrial development except for two large-scale transmission lines that roughly parallel U.S. Highway 40. Other cultural modifications in the area include agricultural development and scattered residences.

The primary viewing locations in this area include Deerlodge Road and recreation kiosk at the east entrance to Dinosaur National Monument, the Yampa Valley Trail, dispersed residences, and U.S. Highway 40. These viewers are located on privately owned property, a state-administered parcel on Deerlodge Road, scattered BLM-administered parcels, and NPS-administered lands adjacent to Deerlodge Road.

G.5.14.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

Scenery

The route of Alternative WYCO-B crosses mostly Class C scenery associated with the rolling steppe and sagebrush hills landscape characteristic of the Wyoming Basin physiographic province. A small portion of Class B scenery is crossed, which is associated with a series of ridges rising toward Wapiti Peak to the south. These landscapes have been modified by two existing transmission lines and U.S. Highway 40, which locally dominates the landscape character. A total of 0.7 mile of Class B scenery and 5.8 miles of Class C scenery are crossed by Alternative WYCO-B.

Viewing Locations

A few dispersed residences, with high-concern viewers, are located in proximity to U.S. Highway 40 and Deerlodge Road that would have views of the Project approximately 1.5 miles away. Other high-concern viewers associated with Dinosaur National Monument, including the recreation kiosk, Deerlodge Road, and Yampa Valley Trail, would have views of the Project from approximately 1 to 3 miles away in an area where the Project is located adjacent to two existing transmission lines. Refer to Figure G-1 for the viewshed displaying the extent of visibility of the Project within Dinosaur National Monument (shown in blue).

Similarly, moderate-concern viewers traveling on U.S. Highway 40, Moffat County Road 85, and Pinyon Ridge Road (an unimproved road) would have views of the Project adjacent to these existing transmission lines except for the crossing of U.S. Highway 40, located approximately 4 miles east of Deerlodge Road, where the Project would not be located adjacent to these linear landscape modifications.

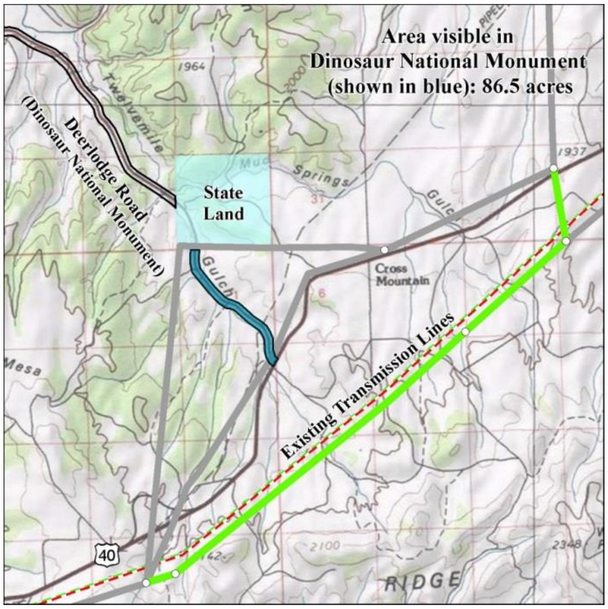
Area visible in
Dinosaur National Monument
(shown in blue): 86.5 acres
Deerlodge Road
(Dinosaur National Monument)
Twelvemile
State
Land
Mud Springs
Gulch
Cross
Mountain
Existing Transmission Lines
Mesa
40
RIDGE
1964
1937
2100
2348

Figure G-1 **Visibility of Alternative WYCO-B in Dinosaur National Monument**

Federal Agency Visual Management Objectives

The route of Alternative WYCO-B crosses 1.6 miles of BLM-administered land with all 1.6 miles in Visual Resource Management (VRM) Class III within the Little Snake Field Office.

No NPS-administered lands are crossed by Alternative WYCO-B.

Bureau of Land Management Visual Resource Inventory Components

The route of Alternative WYCO-B crosses the Cedar Springs Scenic Quality Rating Unit (SQRU) (Class C) in the Little Snake Field Office and the Pinyon Ridge SQRU (Class B) in the White River Field Office.

Alternative WYCO-B crosses the Danford Sensitivity Level Rating Unit (SLRU) (low sensitivity) in the Little Snake Field Office and the Elk Springs SLRU (low sensitivity) in the White River Field Office.

Alternative WYCO-B crosses the BLM foreground-middleground distance zone and Visual Resource Inventory (VRI) Class IV.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Scenery

Variation 1 crosses Class B scenery associated with the dissected hills, containing patches of pinyon-juniper vegetation, between Twelvemile Gulch and Twelvemile Mesa. To the east, Variation 1 crosses Class C scenery similar to the landscapes described for Alternative WYCO-B. These landscapes have been modified locally by U.S. Highway 40, adjacent to where the Project would be located, and two existing transmission lines farther to the south. A total of 2.5 miles of Class B scenery and 4.0 miles of Class C scenery are crossed by Variation 1.

Viewing Locations

A few dispersed residences, with high-concern viewers, are located in proximity to U.S. Highway 40 and Deerlodge Road with views of the Project from less than 0.5 mile away. Views of the Project from the Deerlodge Road recreation kiosk (in Dinosaur National Monument) would occur from less than 500 feet away adjacent to U.S. Highway 40. Refer to Figure G-2 for the viewshed displaying the extent of visibility of the Project within Dinosaur National Monument (shown in blue). High-concern viewers on the Yampa Valley Trail would have views of the Project from approximately 1.5 miles away. Moderate-concern viewers on U.S. Highway 40 would have views of the Project for approximately 6 miles where this Variation 1 parallels the highway. Moffat County Road 85, and associated moderate-concern viewers, would have views of the Project crossing the road immediately north of U.S. Highway 40 approximately 1.5 miles east of Deerlodge Road.

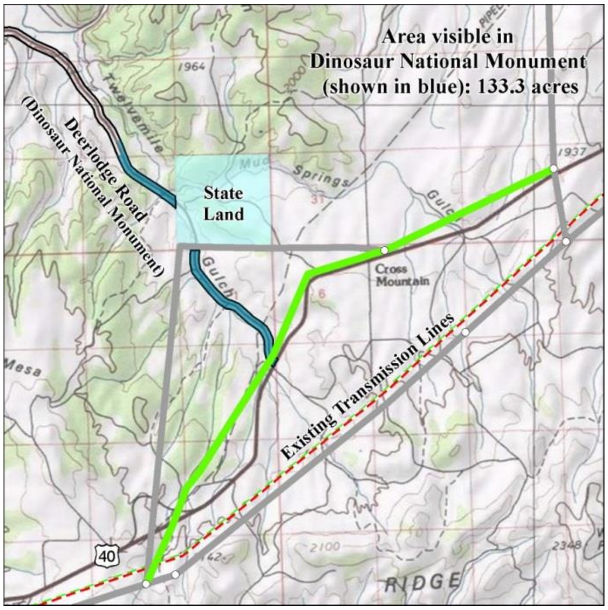

Figure G-2 Visibility of the Variation 1 in Dinosaur National Monument

Federal Agency Visual Management Objectives

No BLM-administered lands are crossed by this Variation 1. Variation 1 crosses Deerlodge Road within the 1,000-foot-wide scenic easement established in the 1987 General Management Plan for Dinosaur National Monument to protect visual qualities of the road’s rangeland character and precludes all future surface mineral activity, including oil and gas extraction.

Bureau of Land Management Visual Resource Inventory Components

Variation 1 crosses the Twelvemile Mesa SQRU (Class B) and Cedar Springs SQRU (Class C) in the Little Snake Field Office and the Pinyon Ridge SQRU (Class B) in the White River Field Office.

Variation 1 crosses the Danford SLRU (low sensitivity) and Godiva/Greystone SLRU (moderate sensitivity) in the Little Snake Field Office and the Elk Springs SLRU (low sensitivity) in the White River Field Office.

Variation 1 crosses the BLM foreground-middleground distance zone and VRI Classes III and IV.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Scenery

Variation 2 crosses Class B associated with dissected hills, containing patches of pinyon-juniper vegetation, between Twelvemile Gulch and Twelvemile Mesa. The portion of these landscapes crossed by the Project occurs where there are limited modifications except for scattered ranching operations, which produce a rural landscape character. Farther to the east, the Project crosses Class C similar to the landscapes described for Alternative WYCO-B. In this area, the Class C landscapes have been modified locally by U.S. Highway 40, adjacent to where the Project is located, and two existing transmission lines further to the south. A total of 3.6 miles of Class B scenery and 4.1 miles of Class C scenery are crossed by Variation 2.

Viewing Locations

A few dispersed residences, with high-concern viewers, are located in in proximity to Deerlodge Road and U.S. Highway 40 with views of the Project from less than 0.5 mile away. Views from Deerlodge Road would occur in an area with limited modifications, except for the aforementioned ranching operations, approximately 1.5 miles north of the entrance from U.S. Highway 40. By being located farther to the north, views of the Project from the Deerlodge Road kiosk would be from approximately 1.5 miles away. Refer to Figure G-3 for the viewshed displaying the extent of visibility of the Project within Dinosaur National Monument (shown in blue). High-concern viewers on the Yampa Valley Trail would have views of the Project from approximately 0.5 mile away where the trail crosses Deerlodge Road. Moderate-concern viewers on U.S. Highway 40 would have views of the Project for approximately 2 miles where this route variation parallels the highway. Moffat County Road 85, and associated moderate-concern viewers, would have views of the Project crossing the road immediately north of U.S. Highway 40 approximately 1.5 miles east of Deerlodge Road.

Federal Agency Visual Management Objectives

Variation 2 crosses 1.5 miles of BLM-administered land with all 1.5 miles in VRM Class III within the Little Snake Field Office.

No NPS-administered lands are crossed by Variation 2 (the crossing of Deerlodge Road occurs in land administered by the State of Colorado).

Bureau of Land Management Visual Resource Inventory Components

Variation 2 crosses the Twelvemile Mesa SQRU (Class B) and Cedar Springs SQRU (Class C) in the Little Snake Field Office and the Pinyon Ridge SQRU (Class B) in the White River Field Office.

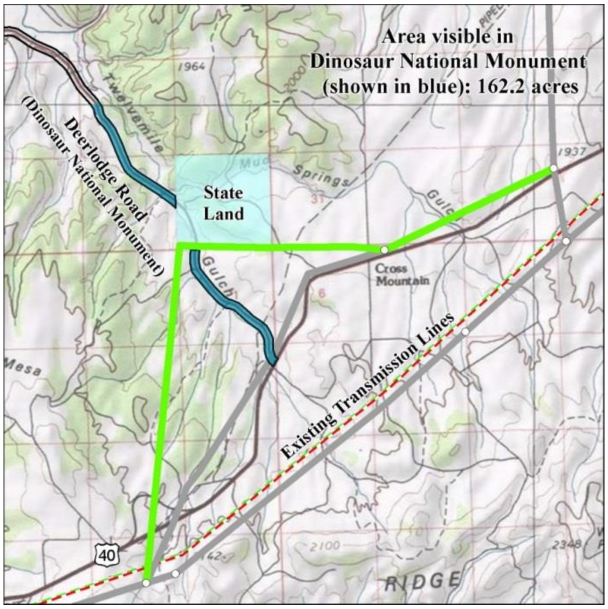
Area visible in
Dinosaur National Monument
(shown in blue): 162.2 acres
Deerlodge Road
(Dinosaur National Monument)
Twelvemile
State Land
Mud Springs
Gulch
Cross Mountain
Existing Transmission Lines
Mesa
40
RIDGE
1964
1937
2100
2348

Figure G-3 Visibility of the Variation 2 in Dinosaur National Monument

Variation 2 crosses the Danford SLRU (low sensitivity) and Godiva/Greystone SLRU (moderate sensitivity) in the Little Snake Field Office and the Elk Springs SLRU (low sensitivity) in the White River Field Office.

Variation 2 crosses the BLM foreground-middleground distance zone and VRI Classes III and IV.

G.5.14.3 Environmental Consequences

Impacts Common to All Action Alternatives

The introduction of the Project would result in long-term effects on visual resources including the degradation of scenery through the presence of vertical elements in the landscape (transmission line structures), areas of cleared vegetation (right-of-way vegetation clearing), and exposed soil from the construction of new permanent access roads, tower work areas, and other ancillary facilities. Long-term impacts on viewing locations also would occur through the introduction of the Project into these viewers' viewshed and in particular, where the setting is largely visually intact.

Short-term effects on both scenery and viewing locations would be increased as a result of construction efforts as well as the additional areas of disturbance associated with construction before reclamation of these temporary work areas occur. These effects include views of additional areas of exposed soil, the presence and movement of construction equipment, and the associated construction activities (e.g., tower construction, stringing).

For a more detailed assessment of impacts on recreation and the overall experience of visitors to Dinosaur National Monument, refer to Section G.5.10. The residual impacts on scenery, high-concern viewers, and moderate-concern viewers for the Deerlodge Road area are presented in Table G-16.

TABLE G-16
ALTERNATIVE ROUTE COMPARISON FOR VISUAL RESOURCES RESIDUAL IMPACTS FOR THE DEERLODGE ROAD AREA

Alternative Route	Total Miles	Residual Impacts (miles)									
		Scenery				High Concern Viewers			Moderate Concern Viewers		
		High	Moderate	Low	Not Identifiable	High	Moderate	Low	High	Moderate	Low
Alternative WYCO-B	6.5	0.0	0.0	6.5	0.0	0.0	0.0	6.5	0.0	0.2	6.3
National Park Service-jurisdiction crossing (Variation 1)	6.5	0.0	0.0	6.5	0.0	2.4	2.9	1.2	0.0	5.7	0.8
State-parcel crossing (Variation 2)	7.7	0.0	3.7	4.0	0.0	3.6	3.0	1.1	0.0	5.0	2.7

Alternative WYCO-B (Links C92, C171, C173, and C174)

Scenery

Alternative WYCO-B would result in low impacts on the Class B and Class C landscapes crossed since the Project directly parallels two existing transmission lines, which locally dominate the existing setting. By being located adjacent to these other linear modifications, the incremental change introduced by the Project, including transmission structures, earthwork, and right-of-way vegetation clearing, would be similar to existing modifications in the landscape.

Viewing Locations

Due to the colocation with the existing transmission lines, views of the Project from Deerlodge Road (including the recreation kiosk), Dinosaur National Monument, and U.S. Highway 40 would be altered minimally since the Project would be located farther from the viewer than these existing transmission lines. In other words, views of the Project would be through the two existing transmission lines reducing the noticeability of the Project. For additional analysis, refer to the contrast rating worksheet for key observation point (KOP) #150 and the associated visual simulation in Appendix M.

Federal Agency Visual Management Objectives

Due to the colocation with the two existing transmission lines, the level of contrast introduced by the Project would be compliant with VRM Class III objectives in the Little Snake Field Office.

No NPS-administered lands would be crossed.

Bureau of Land Management Visual Resource Inventory Components

Alternative WYCO-B would affect scenic quality locally through the introduction of additional cultural modifications, adjacent to similar modifications, within SQRUs including the Cedar Springs and Pinyon Ridge SQRUs. These effects on scenic quality would include the modification of the existing landscape character through geometric right-of-way and structure pad vegetation clearing, construction access roads that would modify existing landforms through curvilinear lines and geometric forms associated with earthwork required for their construction, and a series of tall transmission structures creating a repeating rhythmic pattern across the landscape. No Class A SQRUs would be influenced by the Project since the closest Class A landscape, Cross Mountain Canyon, is located more than 5 miles away and is an enclosed landscape with limited views of adjacent landscapes.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Scenery

Variation 1 would result in low impacts on the Class B and Class C landscapes crossed since the Project parallels U.S. Highway 40, which has locally modified the landscape character, and is located in proximity to two existing transmission lines, which also have modified the area's landscape character. The incremental change introduced by the Project would be apparent but would not considerably modify the overall character of these landscapes.

Viewing Locations

High impacts would occur on unobstructed views from a residence along U.S. Highway 40 where the Project is located within 0.5 mile and on views from a residence adjacent to Deerlodge Road located 0.75 away from the Project. High impacts also are anticipated on views from Deerlodge Road and the recreation kiosk, both located in Dinosaur National Monument, since the Project would be viewed from less than 500 feet away where transmission structures would dominate views from this portion of the monument. Due to the proximity of the Project to these viewers, there are limited selective mitigation measures that would substantially decrease the Project dominance of these views, other than crossing the road in a different location. Additionally, areas of geometrically cleared vegetation in the Project right-of-way would expand the area viewed as modified from this viewpoint. To reduce contrast on geometric vegetation right-of-way clearing, selective mitigation measures would be applied to reduce contrast through minimizing the extent of this clearing and the geometric form produced through this Project activity. For additional analysis, refer to the contrast rating worksheet for KOP #150 and the associated visual simulation in Appendix M.

Moderate impacts are anticipated on views from U.S. Highway 40 due to the long-duration views, approximately 6 miles, where Variation 1 parallels the highway at a distance between 500 feet and 0.5 mile. Due to the proximity of the Project to this highway, there are limited selective mitigation measures that would substantially decrease the impacts on these views other than locating the Project farther to the north. Contrast introduced by areas of geometrically cleared vegetation in the right-of-way would be reduced through minimizing the extent of vegetation clearing and the resulting geometric forms as described above.

Federal Agency Visual Management Objectives

No BLM-administered lands would be crossed.

Variation 1 crosses the 1,000-foot-wide scenic easement along Deerlodge Road and include the introduction of geometric right-of-way and structure pad vegetation clearing, construction access roads, and transmission structures within this easement. The scenic easement could be spanned by the proposed transmission line; therefore, no transmission structures would be located within the easement, but vegetation clearing, construction access roads, and conductors spanning the road would still occur in the easement. Also, high impacts on views from Deerlodge Road would occur from Project features located outside of the scenic easement, influencing visual qualities along the road including its rangeland character.

Bureau of Land Management Visual Resource Inventory Components

Variation 1 would affect scenic quality locally through the introduction of additional cultural modifications, within the SQRUs adjacent to U.S. Highway 40 including the Twelvemile Mesa, Cedar Springs, and Pinyon Ridge SQRUs. These effects on scenic quality would include the modification of the existing landscape character through geometric right-of-way and structure pad vegetation clearing, construction access roads that would modify existing landforms through curvilinear lines and geometric forms associated with earthwork required for their construction, and a series of tall transmission structures creating a repeating rhythmic pattern across the landscape. No Class A SQRUs would be influenced by the Project since the closest Class A landscape, Cross Mountain Canyon, is located approximately 3.5 miles away and is an enclosed landscape with limited views of adjacent landscapes.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Scenery

Variation 2 would result in moderate impacts on Class B landscapes since there are limited modifications currently in these areas and the Project would introduce formal hard-edge geometry into rolling landscapes including right-of-way vegetation clearing. Additionally, the Project would include construction of access roads and tower pads in steep terrain, requiring additional earthwork that would produce stronger visual contrast. In areas where the Project would be constructed on ridgelines, contrast would increase based on strong geometric vertical lines (transmission structures) as compared to the rolling, sinuous lines associated with the topography. In areas of dense pinyon-juniper vegetation crossed by the Project, selective mitigation measures would be applied to reduce the geometric form generated by right-of-way vegetation clearing. Additionally on steep terrain, selective mitigation measures would be applied to reduce ground disturbance associated with the construction of access roads.

Due to the more level terrain present in Class C landscapes crossed, and additional influence from U.S. Highway 40 and the existing transmission lines, low impacts are anticipated on the Class C landscapes crossed.

Viewing Locations

Impacts on residences are similar to those described for Variation 1.

High impacts also are anticipated on views from Deerlodge Road, from both NPS- and state-administered lands, as visitors drive north toward Deerlodge Park. Motorists on Deerlodge Road would have their views dominated by the Project, especially within 0.5 mile of the road, as transmission structures would be located adjacent to the road and viewed in a skylined condition in an area with limited cultural modifications. Selective mitigation measures would be applied to reduce contrast, including minimizing the extent of right-of-way vegetation clearing to reduce the geometric form generated in pinyon-juniper vegetation and maximize the span between transmission line structures, where the road would be crossed, to reduce the visual dominance of the structures. For additional analysis, refer to the contrast rating worksheets for KOPs #331(southbound) and #332 (northbound) and the associated visual simulation from KOP #331 in Appendix M.

Impacts on views from the Yampa Valley Trail would be similar to those described from Deerlodge Road since the trail crosses Deerlodge Road within 0.5 mile of the Project. As the trail enters Mud Springs Gulch, there would be views of skylined structures on the ridge to the south, which would become partially screened as recreationists approach Deerlodge Road. At this intersection, viewers would again have their views dominated by skylined structures on ridges on both the west and east side of the road. For additional analysis, refer to the contrast rating worksheet for KOP #331 and the associated visual simulation in Appendix M.

Impacts on views from U.S. Highway 40 would be similar to those described for Variation 1 except these impacts would occur for a shorter duration, 1.5 miles for Variation 2 instead of 6 miles for Variation 1.

Federal Agency Visual Management Objectives

Based on the contrast rating assessment from KOP #331 on Deerlodge Road, the level of contrast introduced by the Project would be compliant with VRM Class III objectives in the Little Snake Field Office.

No NPS-administered lands are crossed.

Bureau of Land Management Visual Resource Inventory Components

Variation 2 would affect scenic quality locally through the introduction of additional cultural modifications within the SQRUs adjacent to U.S. Highway 40 including the Cedar Springs and Pinyon Ridge SQRUs, with a greater effect on the Twelvemile Mesa SQRU as the Variation 2 alignment is located farther from U.S. Highway 40 and other cultural modifications. These effects on scenic quality would include the modification of the existing landscape character through geometric right-of-way and structure pad vegetation clearing, construction access roads that would modify existing landforms through curvilinear lines and geometric forms associated with earthwork required for their construction, and a series of tall transmission structures creating a repeating rhythmic pattern across the landscape. No Class A SQRUs would be influenced by the Project since the closest Class A landscape, Cross Mountain Canyon, is located approximately 2.5 miles away and is an enclosed landscape with limited views of adjacent landscapes.

G.5.14.4 Summary

In regard to the impacts on viewing locations and scenery, as well as compliance with federal agency visual management objectives, Alternative WYCO-B would be least impactful due to the colocation with two existing transmission lines, which reduces the incremental visual contrast introduced by the Project. Specifically, views from Deerlodge Road, the recreation kiosk, and Dinosaur National Monument, in general, would be modified minimally by the Project due to these existing modifications.

Variation 1 would introduce substantially increased impacts on Deerlodge Road and especially the recreation kiosk, due to the proximity to these viewing locations. Variation 2 would cross the road farther to the north, on a state-administered parcel of land, where motorists also would experience high impacts on their views. The key difference between the impacts on Deerlodge Road from the two different route variations is in regard to existing modifications and experience. The recreation kiosk near U.S. Highway 40 is located adjacent to the highway and has views of two existing transmission lines approximately 1 mile away, whereas the area farther to the north is largely intact with a rangeland character. In regard to experience, views of Variation 2 would occur farther from these existing modifications, and closer to the larger portion of the monument, but in an area where viewers would be traveling along a roadway and would not necessarily stop to view the landscape. Recreationists stopping at the kiosk would have much longer-duration views of the Project resulting from Variation 1 since it is a designated place to stop with a small parking lot and informational signage. It is important to note in regard to the overall experience along Deerlodge Road, a ridge approximately 2 miles north of U.S. Highway 40 visually separates the area where these different route variations occur from an area of stronger rangeland character and the larger portion of the monument, as well as Cross Mountain Canyon and its associated river takeout (refer to Figures G-2 to G-1).

In regard to meeting the purpose of the scenic easement along Deerlodge Road, Alternative WYCO-B minimizes effects on both NPS-administered lands as well as the experience along Deerlodge Road.

Variation 1 would cross the easement within NPS-administered lands and would dominate views from the recreation kiosk, whereas Variation 2 would cross the road in a state-administered parcel, which is not part of the scenic easement, but would highly impact the experience of visitors to this portion of Dinosaur National Monument.

G.5.15 Cultural Resources

G.5.15.1 Cultural Setting

A discussion of the prehistory, history, and cultural development of the Project area is presented in Section 3.2.20.3. The portion of the Project under study is located in the Northern Colorado Plateau cultural area, a highly dynamic region that reflects a long and prolific account of archaeological, ethnological, and historical investigation (Jennings 1957; Steward 1938, 1940). Section 3.2.20.3 presents the chronology for the Northern Colorado Plateau cultural area and outlines the archaeological evidence of the prehistoric groups that inhabited this portion of the Project area. Additionally, a general historic overview of northwestern Colorado is presented at the end of the section.

G.5.15.2 Affected Environment

Alternative WYCO-B (Links C92, C171, C173, and C174)

A total of 14 cultural resource sites were identified in the Class I inventory conducted for this portion of Alternative WYCO-B. Sites consist of 11 prehistoric sites, 2 historic sites, and 1 multi-component site (prehistoric and historic components). Of the sites, 86 percent (n=12) are in the low cultural resource intensity zone (outside of the Project area of potential effect [APE]); 7 percent (n=1) are in the moderate cultural resource intensity zone (outside of, but adjacent to, the boundary of the Project APE); and 7 percent (n=1) are in the high cultural resource intensity zone (in the Project APE). Sites in the low cultural resource intensity zone include 5 prehistoric lithic and artifact scatters, 4 prehistoric campsites, 1 prehistoric thermal feature, 1 historic campsite, and the Old Victory Highway. The site in the moderate cultural resource intensity zone is a prehistoric campsite with a historic component (depression of unknown function and associated trash scatter). The site in the Project APE is a prehistoric lithic scatter. An unrecorded segment of the Old Victory Highway is crossed by Link C92.

There are no National Register of Historic Places (NRHP)-listed properties, National Historic Trails (NHT) or potential NHTs, National Historic Landmarks (NHL), traditional cultural properties (TCP), or Areas of Critical Environmental Concern (ACEC) with cultural components along Alternative WYCO-B. The Old Victory Highway is a visually sensitive cultural resource along this variation.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Class I sites potentially affected by Variation 1 are similar to those identified for Alternative WYCO-B, except for three additional sites in the low cultural resource intensity zone. The differences in the number and type of sites occur along Link C93. Sites identified along this route variation, but not along Alternative WYCO-B, include two prehistoric lithic procurement areas and one prehistoric lithic scatter. Of the 17 sites, 88 percent (n=15) are in the low cultural resource intensity zone and 12 percent (n=2) are in the moderate cultural resource intensity zone. There are no sites in the high cultural resource intensity zone along this route variation. An unrecorded segment of the Old Victory Highway is crossed by Link C93.

There are no NRHP-listed properties, NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components along Variation 1. The Old Victory Highway is a visually sensitive cultural resource along Variation 1.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Class I sites potentially affected by Variation 2 are similar to those identified for Alternative WYCO-B, except for five additional sites in the low cultural resource intensity zone. The differences in the number and type of sites occur along Link C95. Sites identified along Variation 2, but not along Alternative WYCO-B, include 2 prehistoric lithic procurement areas, 1 prehistoric lithic scatter, 1 prehistoric rock shelter, and 1 prehistoric single room structure. Of the 19 sites, 90 percent (n=17) are in the low cultural resource intensity zone and 10 percent (n=2) are in the moderate cultural resource intensity zone. There are no sites in the high cultural resource intensity zone along this route variation. An unrecorded segment of the Old Victory Highway is crossed by Link C95.

There are no NRHP-listed properties, NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components along Variation 2. The Old Victory Highway is a visually sensitive cultural resource along this route variation.

G.5.15.3 Environmental Consequences

Alternative WYCO-B (Links C92, C171, C173, and C174)

Of the three routing options considered for comparison, Alternative WYCO-B has 0.2 mile of high, 0.2 mile of moderate, and 6.1 miles of low cultural resource intensity. It is important to note that the mileages of cultural resource intensity do not correlate directly with an equal number of miles in impacts on cultural resources. The 0.2 mile of high cultural resource intensity is the result of one site (prehistoric lithic scatter) in the Project APE at Link C174. This prehistoric site has been determined not eligible for the NRHP and, therefore, it is not evaluated for proposed Project impacts. It is anticipated that one unrecorded segment of the Old Victory Highway would be crossed by Link C92. Potential impacts on sites in the Project APE could be direct and permanent ground disturbance associated with the construction of the transmission line, associated facilities, and access roads, and direct and indirect permanent disturbances due to changes in public accessibility (i.e., the introduction of new or improved access roads). Potential impacts on sites in the low and moderate cultural resource intensity zones could be direct and indirect permanent disturbances due to changes in public accessibility; and direct and indirect long-term visual and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility. These types of disturbance could damage or destroy cultural resources if not mitigated.

Key resources identified along Alternative WYCO-B include the Old Victory Highway, which is in the Project APE, and the Deerlodge Road. The Deerlodge Road, constructed in 1966, is the only entrance to the eastern portion of the Dinosaur National Monument (NPS 2013). The road is approximately 1.0 mile to the northwest of Link C173, outside of, but adjacent to, the boundary of the Project APE. Although the road corridor is located beyond the Project APE, it could be subject to indirect effects. Issues related to potentially significant effects on the Deerlodge Road were raised by the National Park Service during administrative review of the Draft EIS. There are no records of previously recorded portions of the Deerlodge Road on file at the Colorado State Historic Preservation Officer (SHPO); therefore, it is not included in the Class I counts for Colorado.

If Alternative WYCO-B is selected, a complete Class III intensive pedestrian inventory would be conducted as part of the Class III study. All sites in the high cultural resource intensity zone would be documented and evaluated for eligibility for the NRHP; and sites located in the low and moderate cultural resource intensity zones that meet the criteria establish for potential visual sensitivity also would be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, tribes who have signed the Programmatic Agreement or who have signed a data-sharing agreement with the BLM, and the SHPOs, who would then determine if the Project has the potential to have an adverse effect (i.e., direct and permanent ground disturbance, direct and indirect long-term visual and auditory intrusions, and direct and indirect permanent disturbances due to changes in public accessibility) on these sites. Prior to construction activities in the area, any adverse effects on the sites would need to be resolved per 36 CFR Part 800.6.

National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)

Impacts from Variation 1 would be similar to Alternative WYCO-B, except for slight differences in the levels of cultural resource intensity. Variation 1 has 0.0 miles of high, 0.2 mile of moderate, and 6.3 miles of low cultural resource intensity. It is anticipated that one unrecorded segment of the Old Victory Highway would be crossed by Link C93. Without mitigation, the type of potential impacts would be the same as those described for Alternative WYCO-B. Key resources identified along this route variation are the same as those identified for Alternative WYCO-B. The Deerlodge Road, however, would be crossed by Link C93.

If Variation 1 is selected, the same Class III intensive pedestrian inventory and reporting procedures outlined for Alternative WYCO-B would be employed.

State-parcel Crossing of Deerlodge Road – Variation 2 (Links C94 and C95)

Impacts from Variation 2 would be similar to Alternative WYCO-B, except for slight differences in the levels of cultural resource intensity. Variation 2 has 0.0 miles of high, 0.0 miles of moderate, and 7.7 miles of low cultural resource intensity. It is anticipated that one unrecorded segment of the Old Victory Highway would be crossed by Link C95. The Deerlodge Road, however, would be crossed by Link C95. Without mitigation, the type of potential impacts would be the same as those described for Alternative WYCO-B. Key resources identified along this route variation are the same as those identified for Alternative WYCO-B.

If Variation 2 is selected, the same Class III intensive pedestrian inventory and reporting procedures outlined for Alternative WYCO-B would be employed.

G.5.15.4 Summary

A total of 14 cultural resource sites were identified in the Class I inventory conducted for the portion of Alternative WYCO-B that crosses through the Deerlodge Road Area. Only 7 percent (n=1) of the sites are in the Project APE. It is anticipated that an unrecorded segment of the Old Victory Highway would be crossed by Link C92. Alternative WYCO-B has the fewest number of cultural resources.

Class I sites potentially affected by Variation 1 are similar to those identified for Alternative WYCO-B, except for three additional sites in the low cultural resource intensity zone. There are no known sites in the high cultural resource intensity zone along this route variation; however, it is anticipated that an unrecorded segments of the Old Victory Highway would be crossed by Link C93. Variation 1 has the second highest number of cultural resources.

Class I sites potentially affected by Variation 2 are similar to those identified for Alternative WYCO-B, except for five additional sites outside of the Project APE. There are no known sites in the high cultural resource intensity zone along this route variation; however, it is anticipated that an unrecorded segment of the Old Victory Highway would be crossed by Link C95. Deerlodge Road Area Variation 1 has the highest number of cultural resources.

There are no NRHP-listed properties, NHTs or potential NHTs, NHLs, TCPs, or ACECs with cultural components along these alternative/route variations. The Old Victory Highway is a visually sensitive cultural resource along all three routing options. Key resources identified along these routing options are the Old Victory Highway and the Deerlodge Road, which would be crossed by Variation 1 and Variation 2.

Impacts from Alternative WYCO-B would be similar to Variation 1 and Variation 2, except for slight differences in the levels of cultural resource intensity. Of these, Alternative WYCO-B has the highest miles of high cultural resource intensity. No cultural resources have been documented in the high cultural resource intensity zone along the other two routing options. Compared to Alternative WYCO-B, Variation 1 has the same miles of moderate cultural resource intensity and an additional 0.2 mile of low cultural resource intensity. Variation 2 has 0.0 miles of moderate and an additional 1.6 miles of low cultural resource intensity than Alternative WYCO-B. Potential impacts on sites in the Project APE could be direct and permanent ground disturbance associated with the construction of tower locations and access roads, and direct and indirect permanent disturbances due to changes in public accessibility (i.e., the introduction of new or improved access roads). Potential impacts on sites in the low and moderate cultural resource intensity zones could be direct and indirect permanent disturbances due to changes in public accessibility; and direct and indirect long-term visual and auditory intrusions that could compromise aspects of site integrity, such as setting, feeling, and association, which are components of NRHP eligibility. These types of disturbance could damage or destroy cultural resources if not mitigated.

If one of these routing options is selected, a complete Class III intensive pedestrian inventory would be conducted as part of the Class III study. All sites in the high cultural resource intensity zone would be documented and evaluated for eligibility for the NRHP; and sites located in the low and moderate cultural resource intensity zones that meet the criteria establish for potential visual sensitivity also would be documented and evaluated. All site information would be provided in the Class III inventory report that would be reviewed by the agencies, tribes who have signed the Programmatic Agreement or who have signed a data-sharing agreement with the BLM, and the SHPOs, who would then determine if the Project has the potential to have an adverse effect (i.e., direct and permanent ground disturbance, direct and indirect long-term visual and auditory intrusions, and direct and indirect permanent disturbances due to changes in public accessibility) on these sites. Prior to construction activities in the area, any adverse effects on the sites would need to be resolved per 36 CFR Part 800.6.

G.5.16 Noise

G.5.16.1 Local Setting

This section describes the audible noise calculations for a portion of the proposed route near Dinosaur National Monument in Colorado. Specific consideration is given to the audible noise levels at an NPS kiosk, located at (40°24'16.79"N, 108°20'35.08"W), near the intersection of Deerlodge Road and U.S. Highway 40. Sound levels at the NPS kiosk are reported in this section for fair and foul weather conditions, accounting for the calculated audible noise level of the proposed transmission line and the estimated sound level of the environment audible noise levels at the NPS kiosk were calculated for the three routing options in this area:

- **Alternative WYCO-B**. This routing option passes south of the kiosk and includes Links C171 and C173. The nearest approach of Alternative WYCO-B to the NPS kiosk is 6,353 feet (1.2 miles).
- **National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1**. Variation 1 is nearest the NPS kiosk, which includes Links C93 and C94. The kiosk is located at a pull-off area on Deerlodge Road, adjacent to the northwest edge of U.S. Highway 40. On this routing option,

the transmission line would cross between Highway 40 and the kiosk, passing within 316 feet of the NPS kiosk.

- **State-parcel Crossing of Deerlodge Road – Variation 2**. Variation 2 includes Links C94 and C95. The nearest approach of Variation 2 to the NPS kiosk is 5,472 feet (1.0 mile).

G.5.16.2 Affected Environment

A discussion of transmission line audible noise is included in Section 3.2.23.1.3 of this EIS. Calculated audible noise profiles for transects of the route variations are presented in Appendix O. Near the NPS kiosk, the Project was modeled with the configuration of cross-section 1 (Appendix O, Figure O-1), which depicts the Project at locations where adjacent lines are located at distances greater than 500 feet from the centerline of the proposed 500kV circuit.

The audible noise contribution from the transmission line varies in time. To account for fluctuating sound levels, statistical descriptors are used to describe environmental noise. Exceedance levels (L levels) refer to the A-weighted sound level that is exceeded for a specified percentage of time. Thus, the L_5 level refers to the noise level that is exceeded only 5 percent of the time. The median sound level (L_{50}) refers to the sound level exceeded 50 percent of the time. For the proposed transmission line, calculated L_{50} levels are higher in foul weather than fair weather, and foul weather audible noise is independent of precipitation rate.

The audibility of the Project at the NPS kiosk was assessed by comparing the effect of audible noise sources in the environment, with and without the contribution of the proposed transmission line. Existing audible noise sources include natural ambient sounds[1], man-made sources[2], and rain noise[3]. Sound levels from these sources, are combined according to the following equation where L_N represents the sound level for the Nth source and L_Σ is the cumulative sound level.

$$L_\Sigma=10\cdot\log_{10}\left(10^{L_1/10}+10^{L_2/10}+\cdots+10^{L_N/10}\right),\quad (X\text{-}1)$$

The audibility of the Project is assessed by comparing the cumulative sound levels with and without the contribution of the transmission line in the above equation. For small differences in cumulative sound level (less than 3 dB) Project-related audible noise generally would be imperceptible to an observer at the NPS kiosk. Table G-17 provides a key to audibility for different increases in cumulative sound level.

TABLE G-17
AUDIBILITY OF DIFFERENT CHANGES IN CUMULATIVE SOUND LEVELS

Increase in Sound Level (decibels)	Audibility
0 to 3	Generally insignificant change in perceived loudness (insignificant)
3	Threshold of human perceptibility for loudness changes (perceptible)
5	Clearly noticeable change in perceived loudness (clearly noticeable)
10	Perceived doubling in loudness change (doubling or more)

---

[1] A level of 25.4 dBA, excluding man-made sources of audible noise such as traffic and aircraft, is used as the natural ambient sound level in Table G-19.

[2] According to 2013 data from the Colorado Department of Transportation Traffic Data Explorer and Station ID 101808, average annual daily traffic volume along U.S. Highway 40 is 660 vehicles, with 40 single unit trucks and 130 combination trucks. A level of 34.0 dBA, including man-made sources of audible noise such as traffic and aircraft, is used as the existing ambient sound level in Table G-19.

[3] Rain noise in this appendix is based on predictions from Miller LN, “Sound Levels of Rain and of Wind in the Trees,” Noise Control Engineering 11(3): 101, November-December 1978. Curve R-1 for mostly bare, porous ground is used for rain sound levels Table G-19.

G.5.16.3 Environmental Consequences

Calculated audible noise levels at the NPS kiosk are summarized for each route variation in Table G-18. For each of the three routing options considered, L_{50} values are given for fair weather conditions (i.e., no precipitation) and for foul weather conditions (i.e., precipitation). For each entry in Table G-18 (Calculated Transmission Line Noise Levels at the NPS kiosk), the audible noise contribution of the transmission line was calculated using two techniques:

- Methods developed at the High Voltage Transmission Research Center and implemented in the software application SUBCALC, which is part of the Enertech EMF [electric and magnetic fields]Workbench Suite; and
- Computer algorithms developed by the Bonneville Power Administration[4].

Each reported audible noise level in Table G-18 reflects the highest audible noise level obtained by either technique.

TABLE G-18
CALCULATED TRANSMISSION LINE NOISE LEVELS AT THE NATIONAL PARK SERVICE KIOSK

Route Variation	Coordinates of Transmission Line Point Closest to Kiosk	Distance to Kiosk (feet)	Fair Weather L_{50} (dBA)	Foul Weather L_{50} (dBA)
Alternative WYCO-B	40°23'26.88"N, 108°19'45.26"W	6,353	<5.0	<27.0
National Park Service-jurisdiction crossing (Variation 1)	40°24'15.07"N, 108°20'31.68"W	316	28.8	41.7
State-parcel crossing (Variation 2)	40°24'23.89"N, 108°21'45.20"W	5,472	<5.0	<28.0

NOTES:
L_{50} = Median sound level
dBA = Decibels (A-weighted)

An analysis of all natural, rain, and transmission-line audible noise sources is provided in Table G-19 for each routing option.

TABLE G-19
CUMULATIVE AUDIBLE NOISE LEVELS FOR THE CONSTRUCTION ROUTE

				Excluding Traffic and Aircraft			Including Traffic and Aircraft		
Rain Rate	Natural L_{50} (dBA)	Rain Noise (dBA)	Transmisison Line L_{50} (dBA)	Cumulative (dBA)	Increase Over Natural Plus Rain (dBA)	Audibility	Cumulative (dBA)	Increase Over Natural Plus Rain (dBA)	Audibility
Alternative WYCO-B (Links C92, C171, C173, and C174)									
0.00	25.4	-99.0	<5.0	25.4	0.0	Insignificant	25.4	0.0	Insignificant
0.10	25.4	28.0	<27.0	31.7	1.8	Insignificant	31.7	1.8	Insignificant
0.75	25.4	36.8	<27.0	37.5	0.4	Insignificant	37.5	0.4	Insignificant
6.50	25.4	46.1	<27.0	46.2	0.1	Insignificant	46.2	0.1	Insignificant
25.40	25.4	52.0	<27.0	52.1	0.0	Insignificant	52.1	0.0	Insignificant

---

[4] Bonneville Power Administration. Corona and Field Effects Computer Program, 1991.

TABLE G-19
CUMULATIVE AUDIBLE NOISE LEVELS FOR THE CONSTRUCTION ROUTE

Rain Rate	Natural L_{50} (dBA)	Rain Noise (dBA)	Transmisison Line L_{50} (dBA)	Excluding Traffic and Aircraft			Including Traffic and Aircraft		
				Cumulative (dBA)	Increase Over Natural Plus Rain (dBA)	Audibility	Cumulative (dBA)	Increase Over Natural Plus Rain (dBA)	Audibility
National Park Service-jurisdiction Crossing of Deerlodge Road – Variation 1 (Links C94 and C93)									
0.00	25.4	-99.0	28.8	30.4	5.0	Clearly Noticeable	35.1	1.1	Insignificant
0.10	25.4	28.0	41.7	42.0	12.1	Doubling or more	42.5	7.6	Clearly noticeable
0.75	25.4	36.8	41.7	43.0	5.9	Clearly noticeable	43.4	4.8	Perceptible
6.50	25.4	46.1	41.7	47.5	1.3	Insignificant	47.7	1.3	Insignificant
25.40	25.4	52.0	41.7	52.4	0.4	Insignificant	52.5	0.4	Insignificant
State-parcel Crossing of Deerlodge Road – Variation 2 (Links 94 and 95)									
0.00	25.4	-99.0	<5.0	25.4	0.0	Insignificant	34.0	0.0	Insignificant
0.10	25.4	28.0	<28.0	32.1	2.2	Insignificant	35.8	0.8	Insignificant
0.75	25.4	36.8	<28.0	37.6	0.5	Insignificant	39.0	0.4	Insignificant
6.50	25.4	46.1	<28.0	46.2	0.1	Insignificant	46.4	0.1	Insignificant
25.40	25.4	52.0	<28.0	52.1	0.0	Insignificant	52.1	0.0	Insignificant

NOTES:
L_{50} = Median sound level
dBA = Decibels (A-weighted)

G.5.16.4 Summary

The results show that, for Alternative WYCO-B and Variation 2, Project-related audible noise is imperceptible at the NPS kiosk. For the Variation 1, which is 316 feet from the NPS kiosk, the proposed transmission line clearly would be noticeable (+5.0 dBA) in fair weather conditions, but without considering the effects of traffic. Accounting for man-made audible noise sources, the increase in cumulative sound level (1.1 dBA) reflects masking of transmission-line audible noise by noises from airplanes, traffic, and the like. The greatest increase in cumulative sound level (12.1 dBA), occurs during light precipitation. In this condition for Variation 1, the audible noise level from the transmission line is 41.7 dBA, and not masked by the sound of rainfall.

G.6 References

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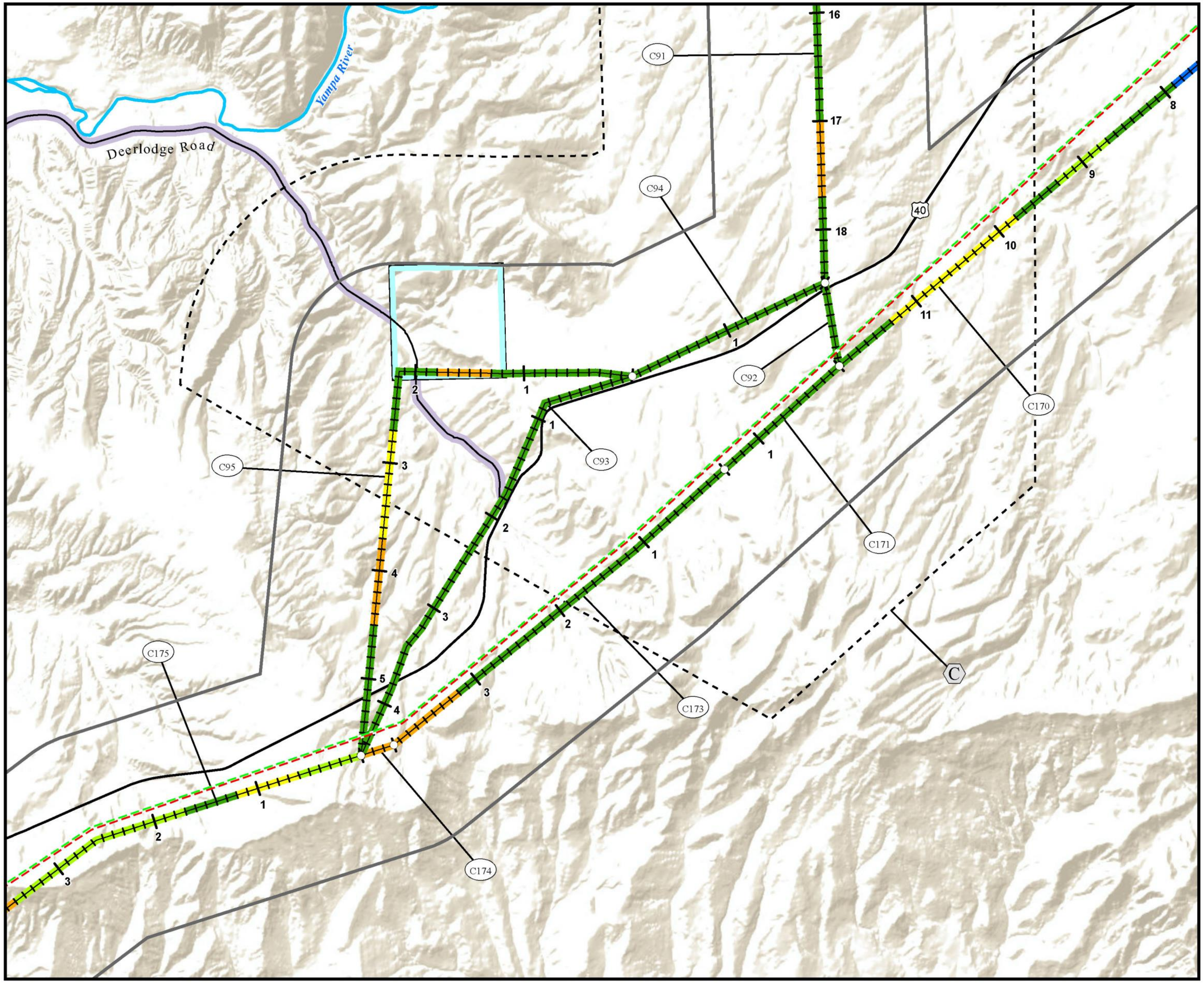
Exhibit G1
Maps



Map G-1

Construction Access Levels

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Construction Access Levels

- 🟩 1 - Use existing roads
- 🟩 2 - Improve existing roads
- 🟨 4 - Construct new access, rolling terrrain (8 to 15 percent slope)
- 🟧 5 - Construct new access, steep terrain (15 to 30 percent slope)

Project Features

- ▭ Study Corridor
- ○ Link Node
- 5 Alternative Route (with Milepost Identifier)
- Series Compensation Station Siting Area
- Link Number

Land Ownership

- State Land[1] (where Deerlodge Road crosses)
- Dinosaur National Monument

General Reference

- 345kV Transmission Line
- U.S. Highway
- 138kV Transmission Line
- Other Road
- River or Stream

SOURCES:
Construction Access Levels, EPG 2014;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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Miles

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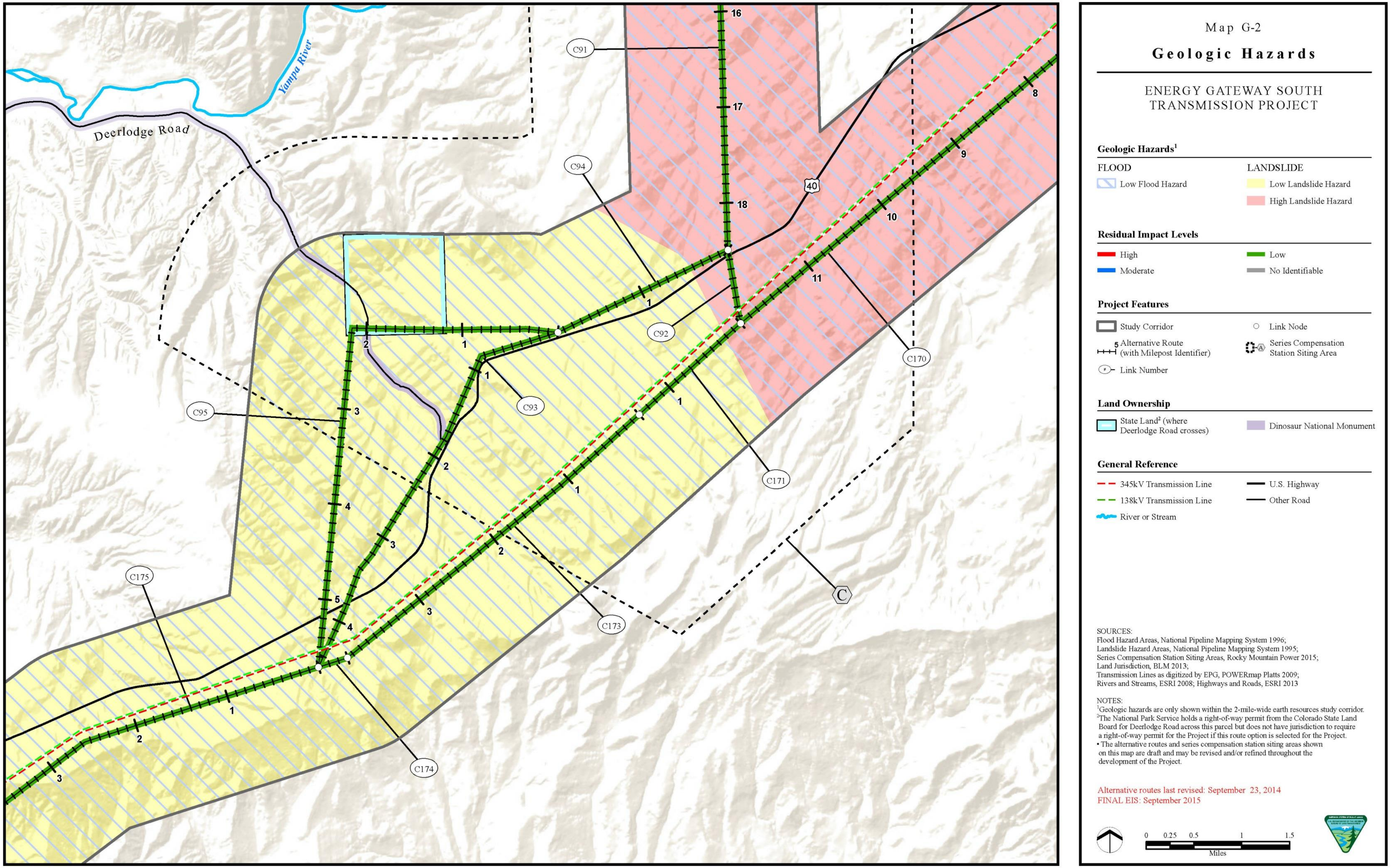

Map G-2

Geologic Hazards

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

SOURCES:
Flood Hazard Areas, National Pipeline Mapping System 1996;
Landslide Hazard Areas, National Pipeline Mapping System 1995;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] Geologic hazards are only shown within the 2-mile-wide earth resources study corridor.

[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

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FINAL EIS: September 2015

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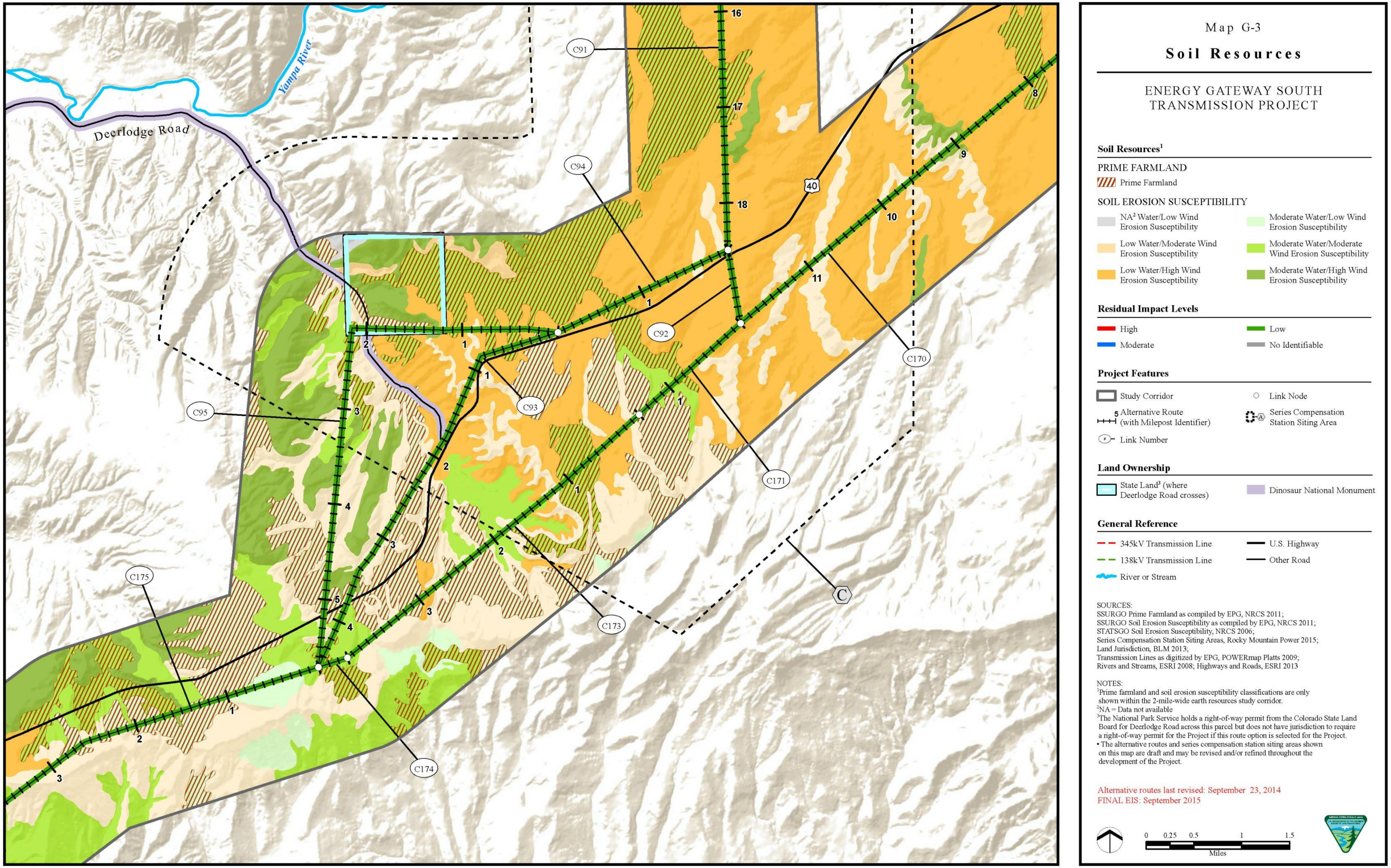
16
17
18
C91
C94
Yampa River
Deerlodge Road
40
8
9
10
11
C92
C93
C95
C170
C171
C173
C174
C175
C
1
2
3
4
5
Soil Resources¹
PRIME FARMLAND
▨ Prime Farmland
SOIL EROSION SUSCEPTIBILITY
NA² Water/Low Wind Erosion Susceptibility
Low Water/Moderate Wind Erosion Susceptibility
Low Water/High Wind Erosion Susceptibility
Moderate Water/Low Wind Erosion Susceptibility
Moderate Water/Moderate Wind Erosion Susceptibility
Moderate Water/High Wind Erosion Susceptibility
Residual Impact Levels
High
Moderate
Low
No Identifiable
Project Features
Study Corridor
5 Alternative Route (with Milepost Identifier)
Link Number
○ Link Node
Series Compensation Station Siting Area
Land Ownership
State Land³ (where Deerlodge Road crosses)
Dinosaur National Monument
General Reference
345kV Transmission Line
138kV Transmission Line
River or Stream
U.S. Highway
Other Road
0 0.25 0.5 1 1.5
Miles

Map G-3

Soil Resources

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

SOURCES:
SSURGO Prime Farmland as compiled by EPG, NRCS 2011;
SSURGO Soil Erosion Susceptibility as compiled by EPG, NRCS 2011;
STATSGO Soil Erosion Susceptibility, NRCS 2006;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] Prime farmland and soil erosion susceptibility classifications are only shown within the 2-mile-wide earth resources study corridor.

[2] NA = Data not available

[3] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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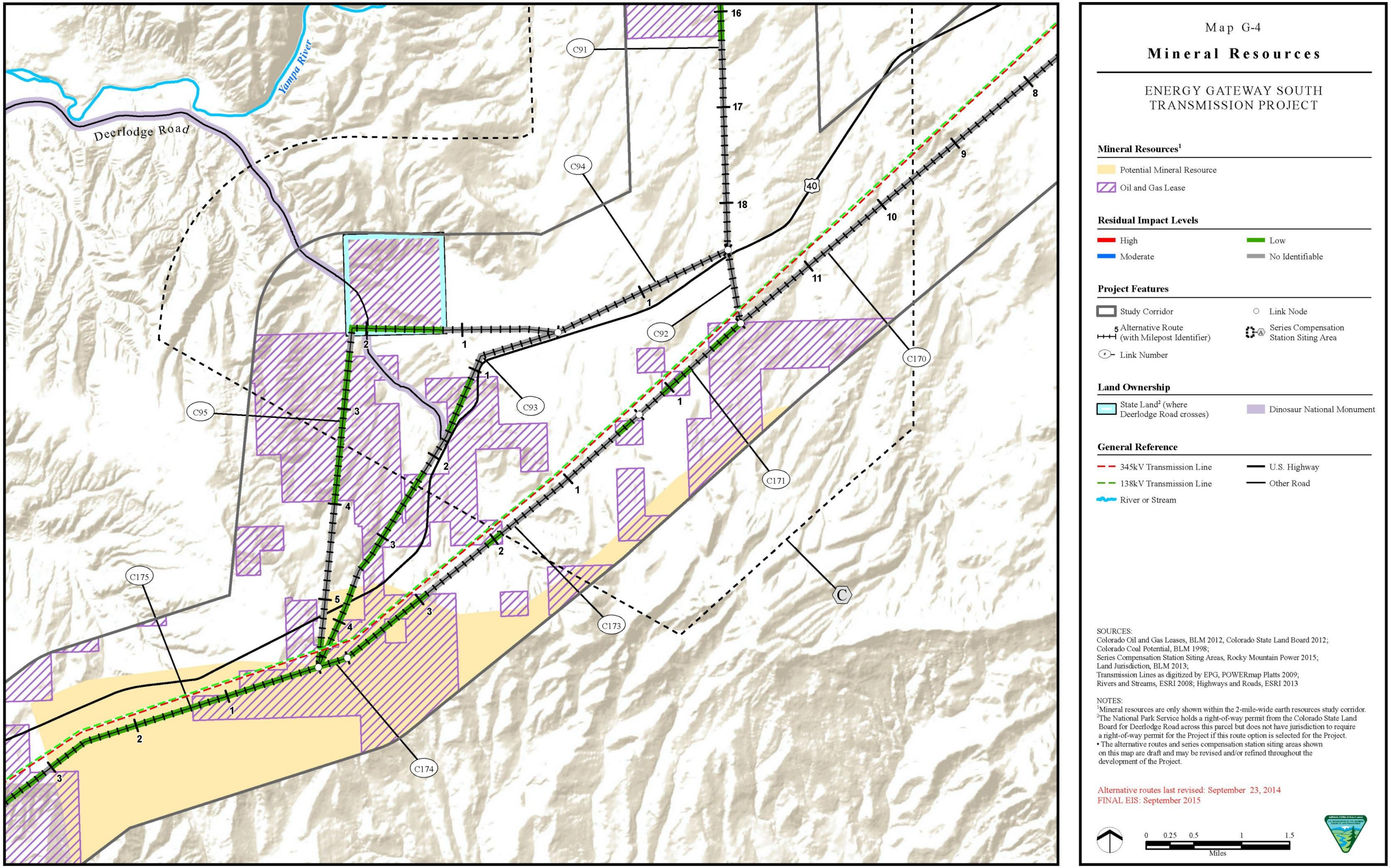

Map G-4

Mineral Resources

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

SOURCES:
Colorado Oil and Gas Leases, BLM 2012, Colorado State Land Board 2012;
Colorado Coal Potential, BLM 1998;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] Mineral resources are only shown within the 2-mile-wide earth resources study corridor.
[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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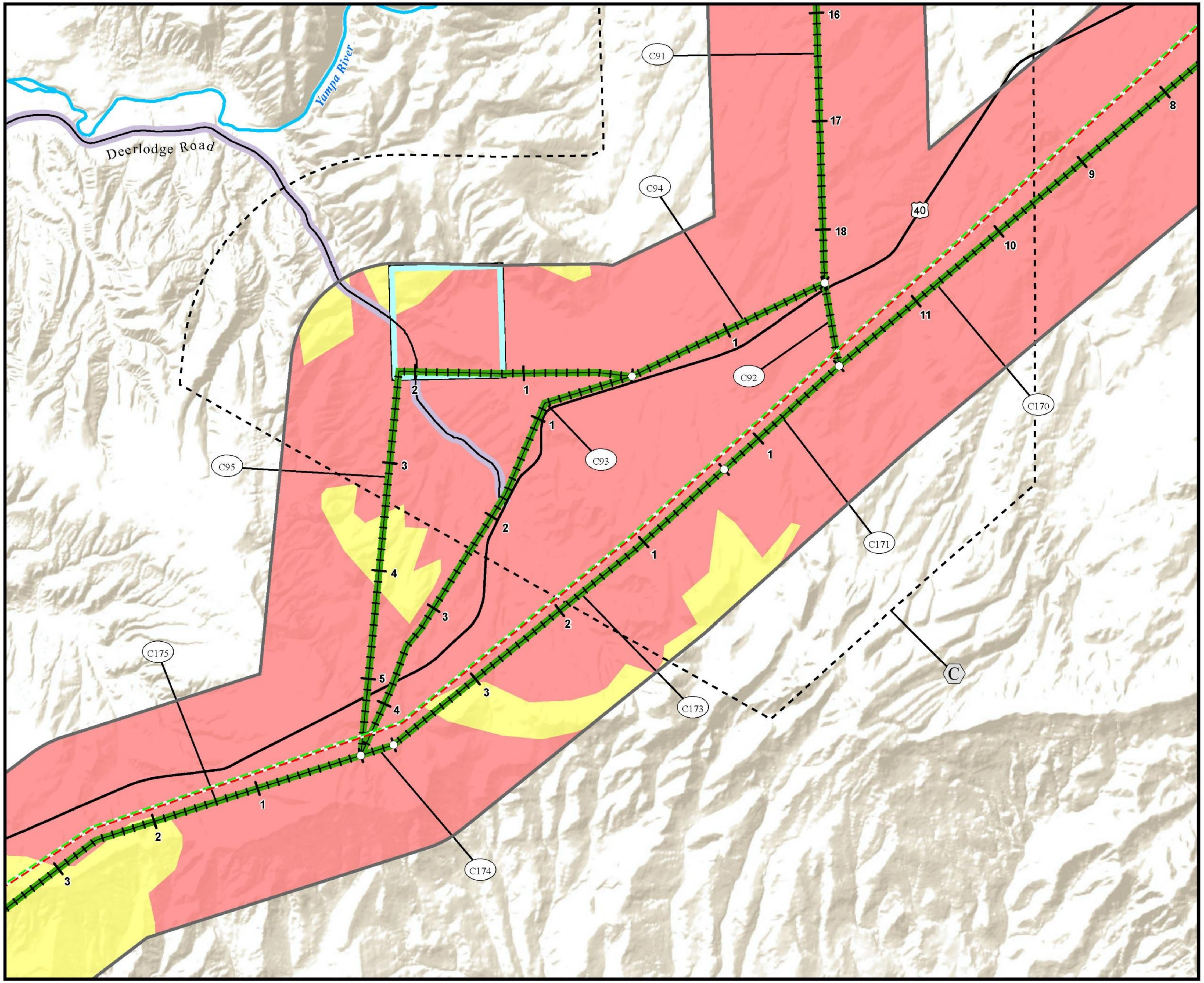


Map G-5

Paleontological Resources

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Paleontological Resources[1]

POTENTIAL FOSSIL YIELD CLASSIFICATIONS

🟥 Very High

🟨 Moderate/Undetermined

Residual Impact Levels

High

Moderate

Low

No Identifiable

Project Features

Study Corridor

Alternative Route (with Milepost Identifier)

Link Number

Link Node

Series Compensation Station Siting Area

Land Ownership

State Land[2] (where Deerlodge Road crosses)

Dinosaur National Monument

General Reference

345kV Transmission Line

138kV Transmission Line

River or Stream

U.S. Highway

Other Road

SOURCES:
Potential Fossil Yield Classification, USGS 2005;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

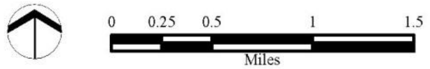
NOTES:

[1] Paleontological resources are only shown within the 2-mile-wide paleontological resources study corridor.

[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015



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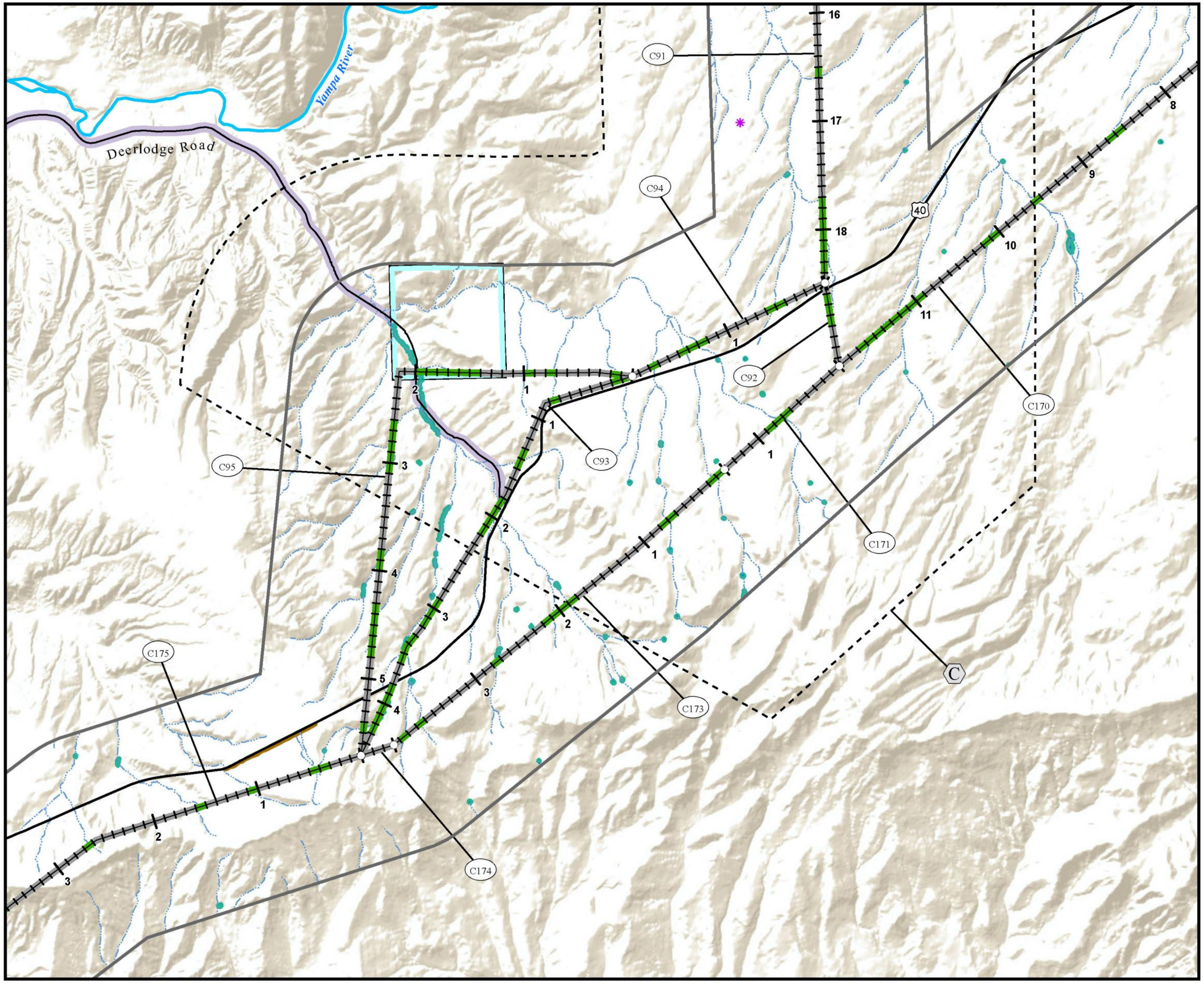

Map G-6

Water Resources

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Water Resources[1]

WETLAND AND RIPARIAN AREAS

Palustrine Emergent Wetland

LENTIC AND LOTIC WATERS

✱ Spring or Well	Intermittent Stream
Canal	Lake, Pond, Reservoir, or Perennial Stream

Residual Impact Levels

🟥 High	🟩 Low
🟦 Moderate	No Identifiable

Project Features

Study Corridor	○ Link Node
5 Alternative Route (with Milepost Identifier)	Series Compensation Station Siting Area
Link Number	

Land Ownership

State Land[2] (where Deerlodge Road crosses)	Dinosaur National Monument

General Reference

345kV Transmission Line	U.S. Highway
138kV Transmission Line	Other Road
River or Stream	

SOURCES:
National Wetland Inventory, FWS 2011;
National Hydrography Dataset, USGS 2010;
Riparian Areas Land Cover GAP, USGS 2010;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] Water resources are identified within the geographic scope of analysis defined in Chapter 3 of the Final Environmental Impact Statement. For visual representation these resources are displayed within a 2-mile-wide corridor.

[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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Miles

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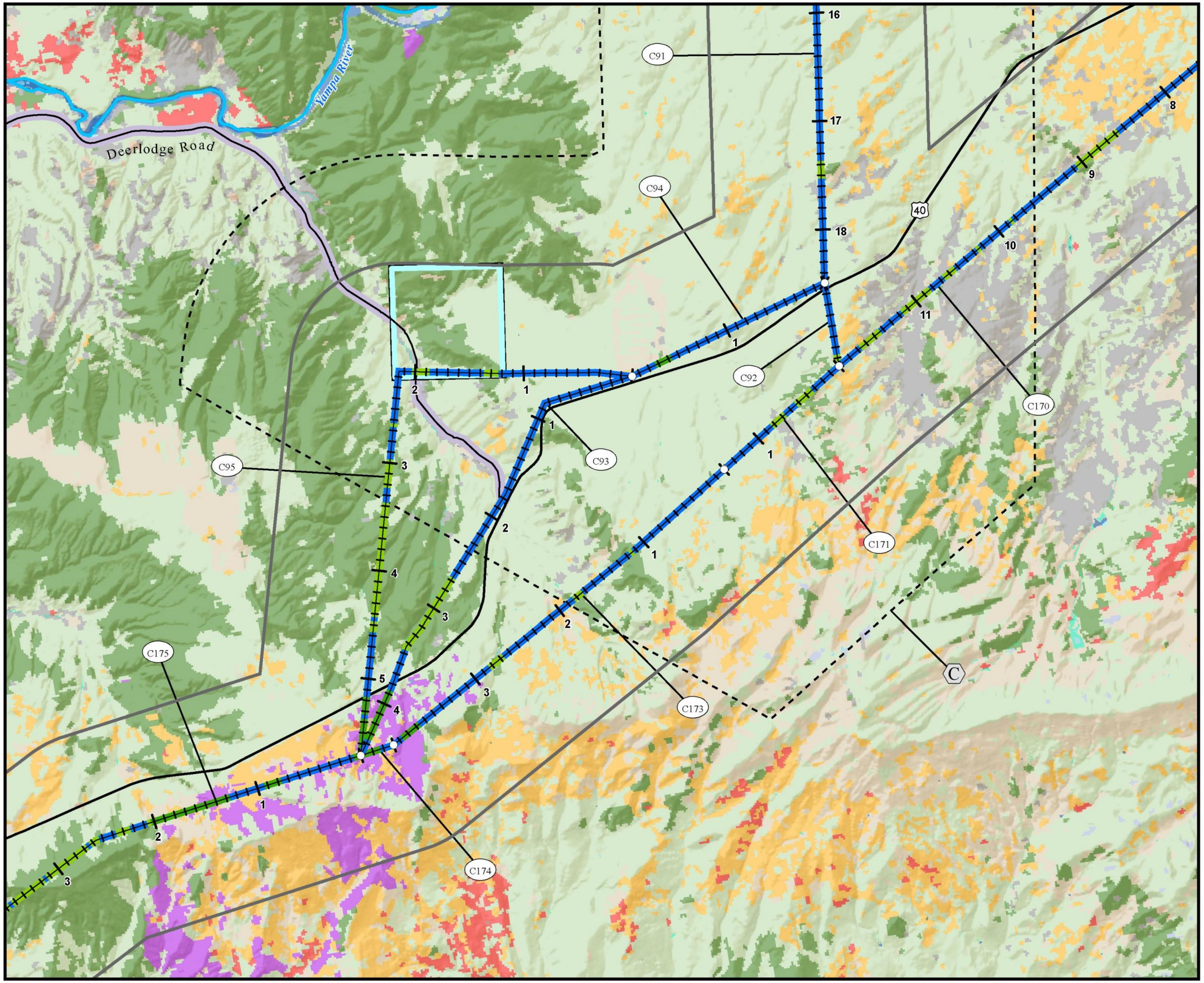

Map G-7

Vegetation

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Primary Vegetation Communities

▨ Agriculture	▨ Mountain Shrub
▨ Barren/Sparsely Vegetated	🟩 Pinyon-juniper
▨ Big Sagebrush	▨ Riparian
🟪 Developed/Disturbed	▨ Shrub/Shrub Steppe
🟨 Grassland	🟦 Water
🟥 Invasive	▨ Wetland

Residual Impact Levels

🟥 High	🟩 Low/Moderate
🟧 Moderate/High	🟩 Low
🟦 Moderate	▨ No Identifiable

Project Features

▭ Study Corridor	○ Link Node
5 Alternative Route (with Milepost Identifier)	Series Compensation Station Siting Area
Link Number	

Land Ownership

▭ State Land[1] (where Deerlodge Road crosses)	▨ Dinosaur National Monument

General Reference

345kV Transmission Line	U.S. Highway
138kV Transmission Line	Other Road
River or Stream	

SOURCES:
Land Cover GAP, USGS 2010; National Wetland Inventory, FWS 2011;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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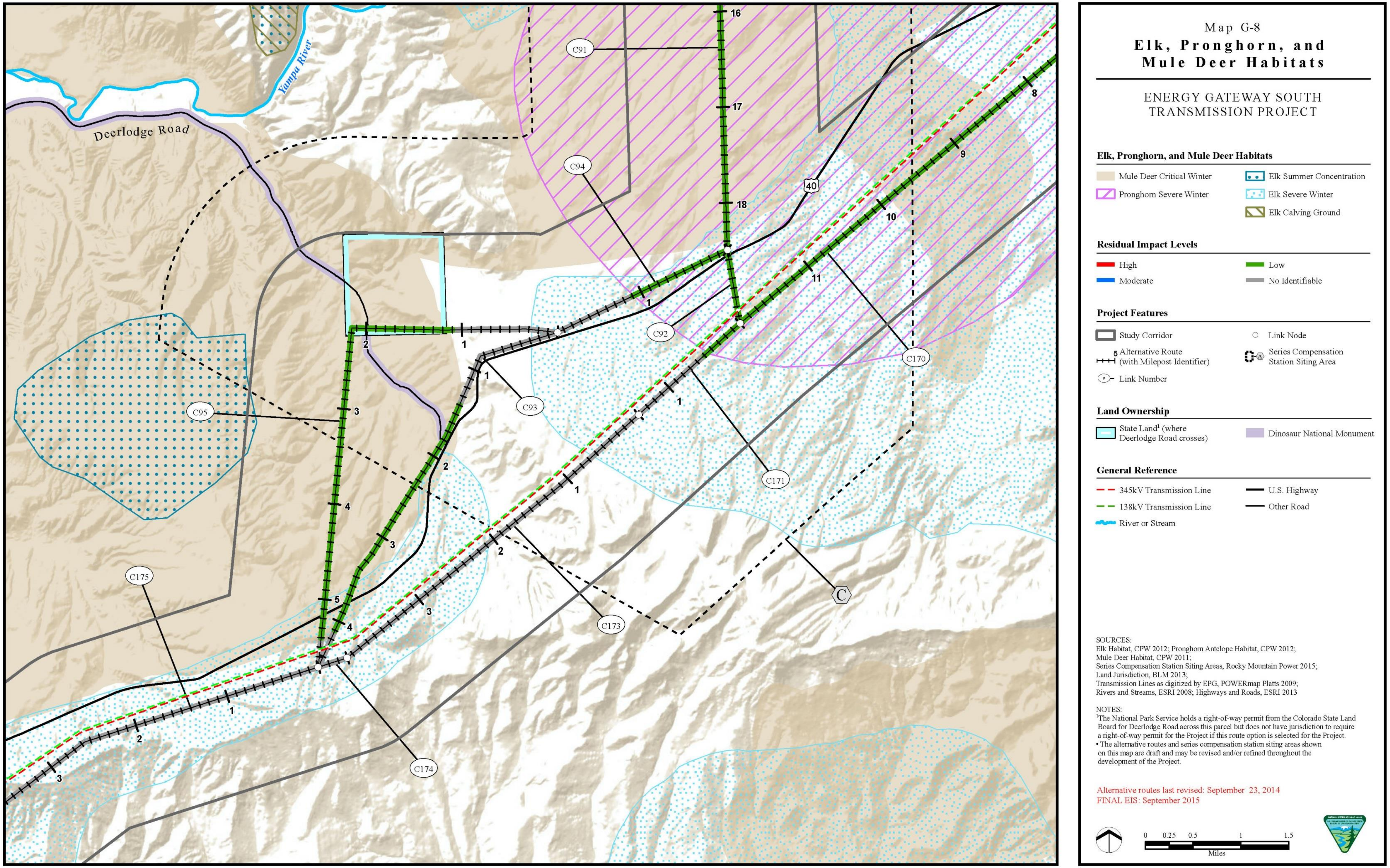

Map G-8

Elk, Pronghorn, and Mule Deer Habitats

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

SOURCES:
Elk Habitat, CPW 2012; Pronghorn Antelope Habitat, CPW 2012;
Mule Deer Habitat, CPW 2011;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.
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Alternative routes last revised: September 23, 2014
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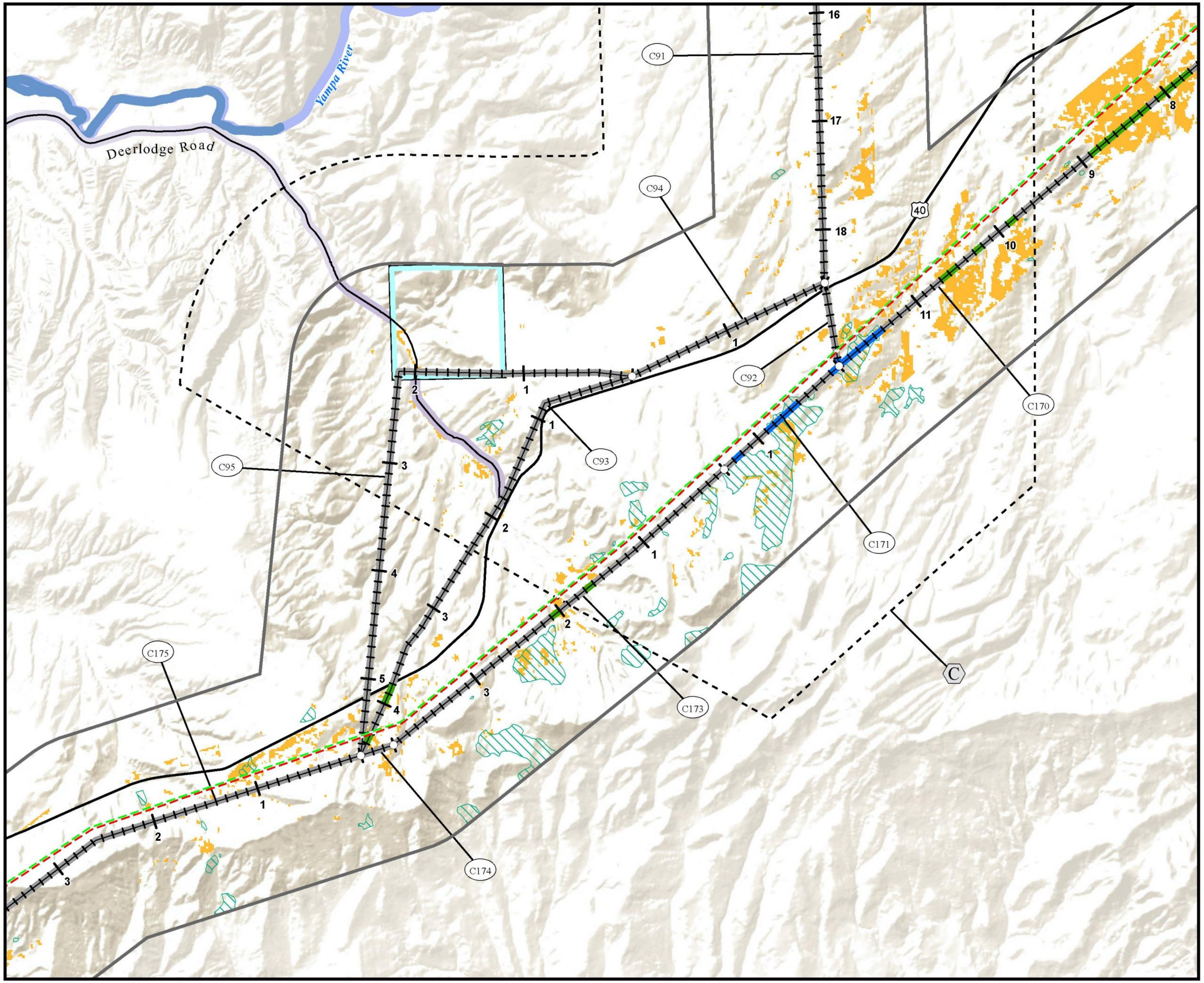

Map G-9

Special Status Fish and Wildlife Habitats

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Special Status Fish and Wildlife Habitats

SPECIAL STATUS WILDLIFE HABITATS

- ▨ White-tailed Prairie Dog Potential Colonies[1]
- 🟧 Mountain Plover Potential Habitat[2]

SPECIAL STATUS FISH HABITATS

- 🟪 Colorado Pikeminnow Critical Habitat
- 🟦 Razorback Sucker and Colorado Pikeminnow Critical Habitat

Residual Impact Levels

- 🟥 High
- 🟩 Low
- 🟦 Moderate
- ⬜ No Identifiable

Project Features

- ▭ Study Corridor
- ○ Link Node
- 5 Alternative Route (with Milepost Identifier)
- Ⓐ Series Compensation Station Siting Area
- Link Number

Land Ownership

- ▭ State Land[3] (where Deerlodge Road crosses)
- 🟪 Dinosaur National Monument

General Reference

- 345kV Transmission Line
- U.S. Highway
- 138kV Transmission Line
- Other Road
- River or Stream

SOURCES:
Colorado River Fish Critical Habitat, FWS 2011;
Mountain Plover Modeled Habitat, EPG 2014;
White-tailed Prairie Dog Modeled Habitat, EPG 2014;
White-tailed Prairie Dog Habitat, BLM 2006, 2008, 2009, 2010, 2011, 2012, CPW 2012;
Series Compensation Station Siting Areas, Rocky Mountain Power 2014;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] White-tailed prairie dog potential colonies are only shown within the 2-mile-wide biological resources study corridor.

[2] Mountain plover potential habitat is only shown within the 1-mile-wide biological resources study corridor.

[3] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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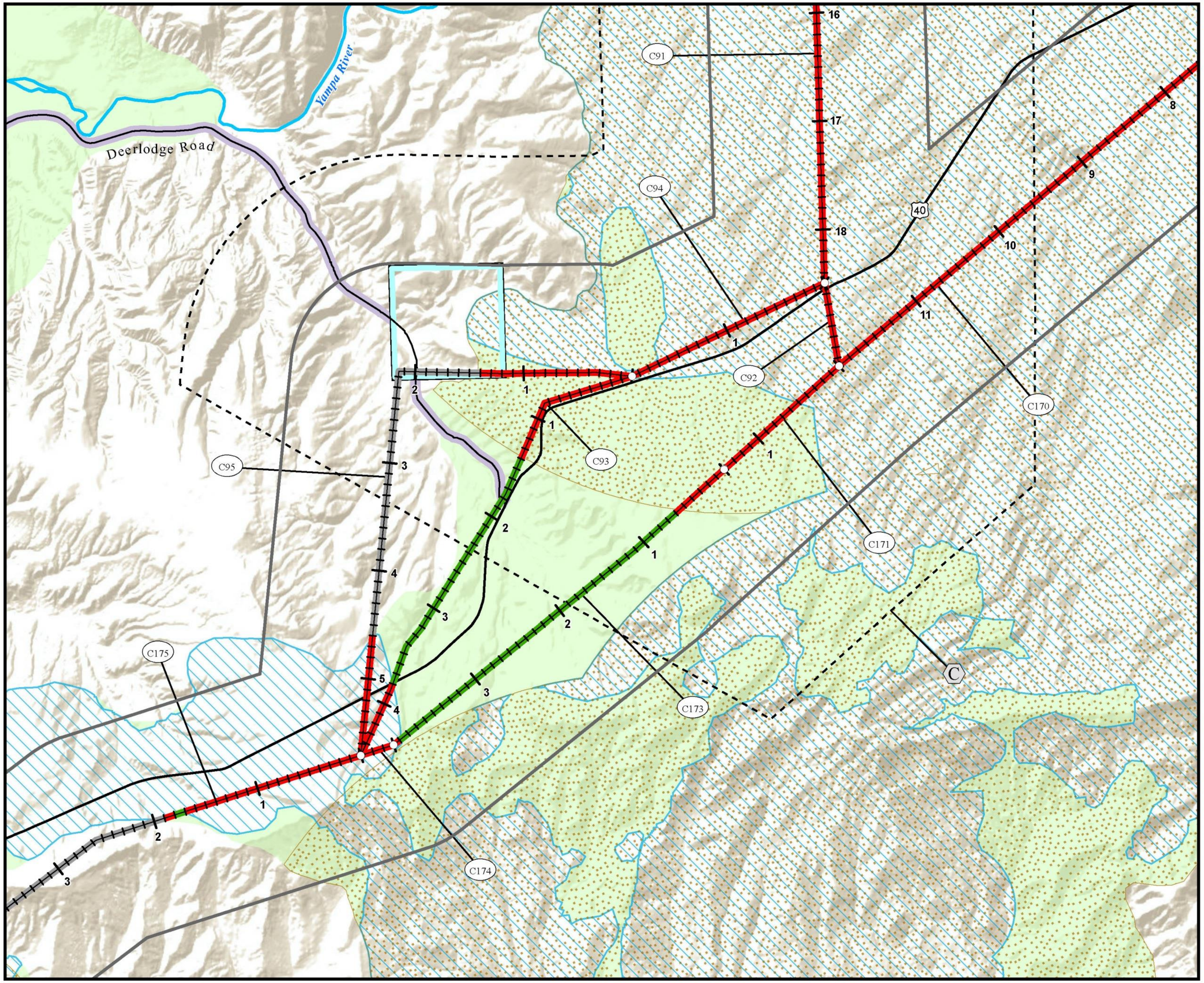

Map G-10

Greater Sage-grouse Habitats

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Greater Sage-Grouse Habitat

- ▨ Greater Sage-grouse Priority Habitat
- 🟩 Greater Sage-grouse General Habitat[1]
- ▨ Greater Sage-grouse Habitat within 4 miles of Leks Located in Priority Habitat

Residual Impact Levels

- 🟥 High
- 🟩 Low
- 🟦 Moderate
- ⬜ No Identifiable

Project Features

- ⬜ Study Corridor
- ○ Link Node
- 5 Alternative Route (with Milepost Identifier)
- Series Compensation Station Siting Area
- Link Number

Land Ownership

- ⬜ State Land[2] (where Deerlodge Road crosses)
- 🟪 Dinosaur National Monument

General Reference

- 345kV Transmission Line
- U.S. Highway
- 138kV Transmission Line
- Other Road
- River or Stream

SOURCES:
Sage-grouse Preliminary Priority Habitat Colorado, CPW 2012j;
Sage-grouse Leks, CPW 2014,
Sage-grouse Preliminary General Habitat Colorado, CPW 2012j;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] Includes preliminary general sage-grouse habitat in Colorado.
[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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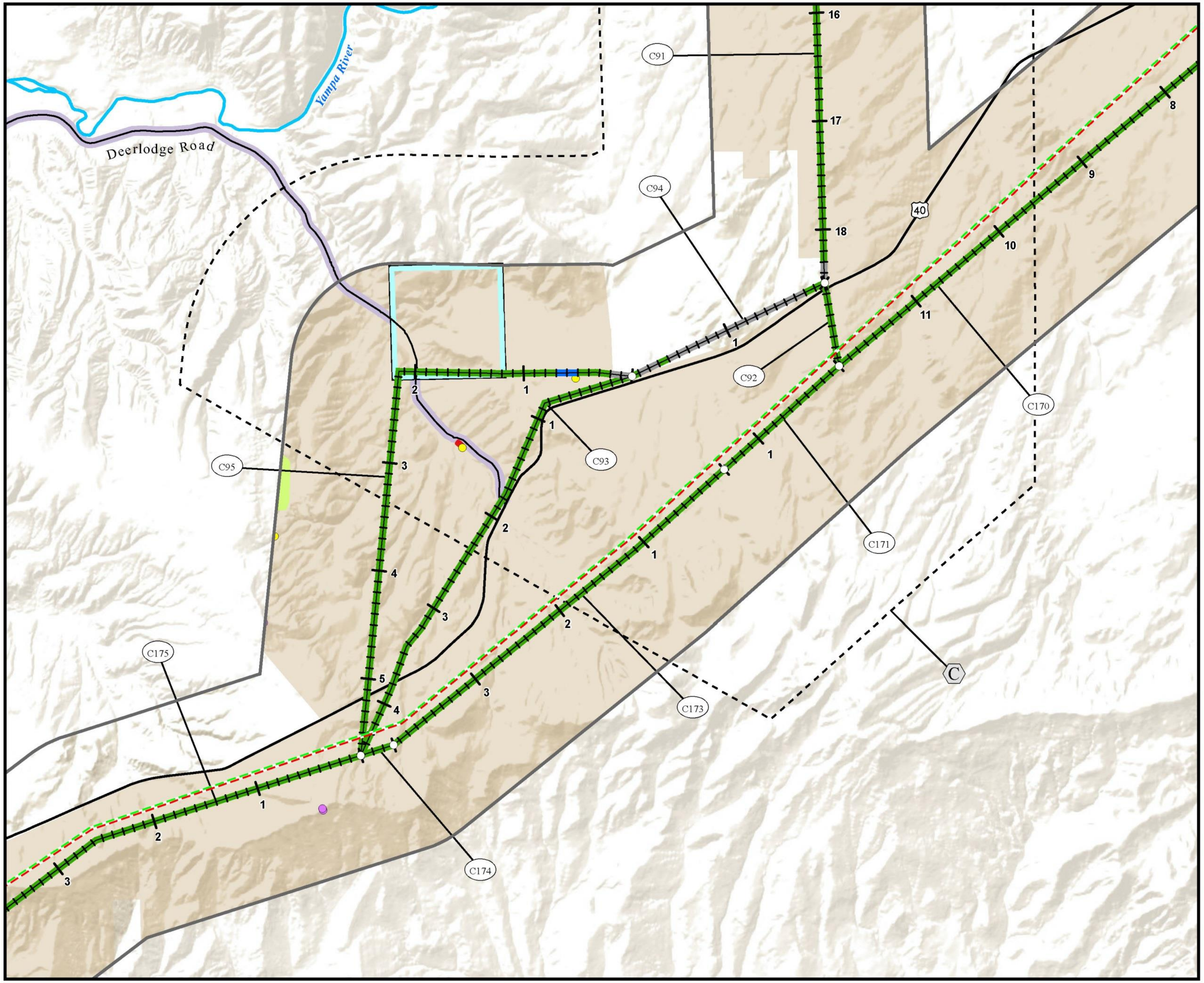

Map G-11

Existing Land Use

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Existing Land Use[1]

🟩 Agriculture	▨ Grazing Allotment
🟥 Commercial	● Residential
● Communication Facility	

Residual Impact Levels

High	Low
Moderate	No Identifiable

Project Features

Study Corridor	○ Link Node
5 Alternative Route (with Milepost Identifier)	Series Compensation Station Siting Area
Link Number	

Land Ownership

State Land[2] (where Deerlodge Road crosses)	Dinosaur National Monument

General Reference

345kV Transmission Line	U.S. Highway
138kV Transmission Line	Other Road
River or Stream	

SOURCES:
Existing Land Use as digitized by EPG, NAIP 2011, 2012, 2013, Bing 2014;
Communication Facilities, FCC 2012; Grazing Allotments, BLM 2009;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] Existing land use is only shown within the 2-mile-wide land use study corridor.
[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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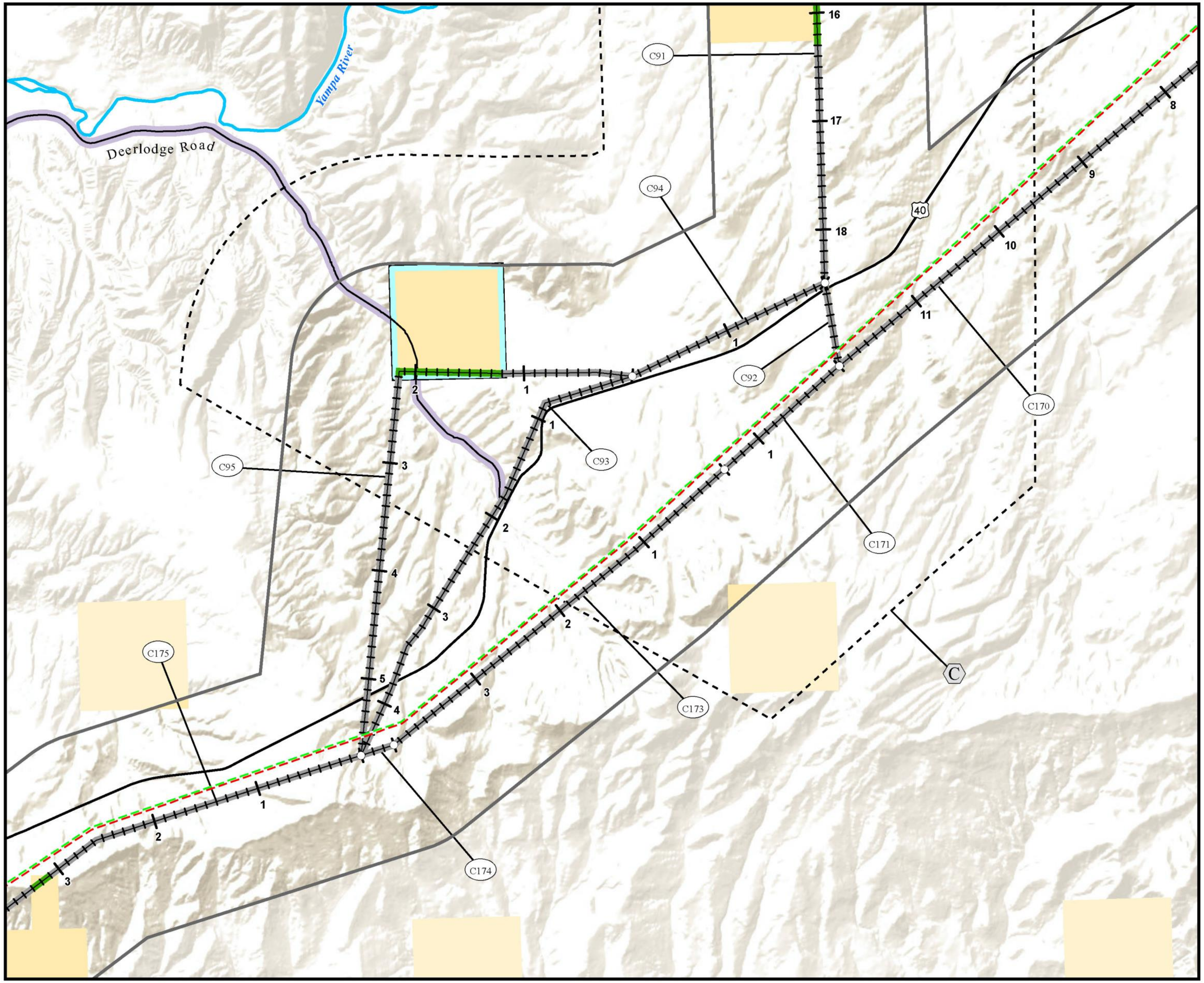

Map G-12

Authorized Land Use

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Authorized Land Use

- 🟨 Oil and/or Gas Development

Residual Impact Levels

🟥 High	🟩 Low
🟦 Moderate	▬ No Identifiable

Project Features

▭ Study Corridor	○ Link Node
5 Alternative Route (with Milepost Identifier)	Series Compensation Station Siting Area
Link Number	

Land Ownership

State Land[1] (where Deerlodge Road crosses)	Dinosaur National Monument

General Reference

345kV Transmission Line	U.S. Highway
138kV Transmission Line	Other Road
River or Stream	

SOURCES:
Oil and Gas Leases, Colorado State Land Board 2012;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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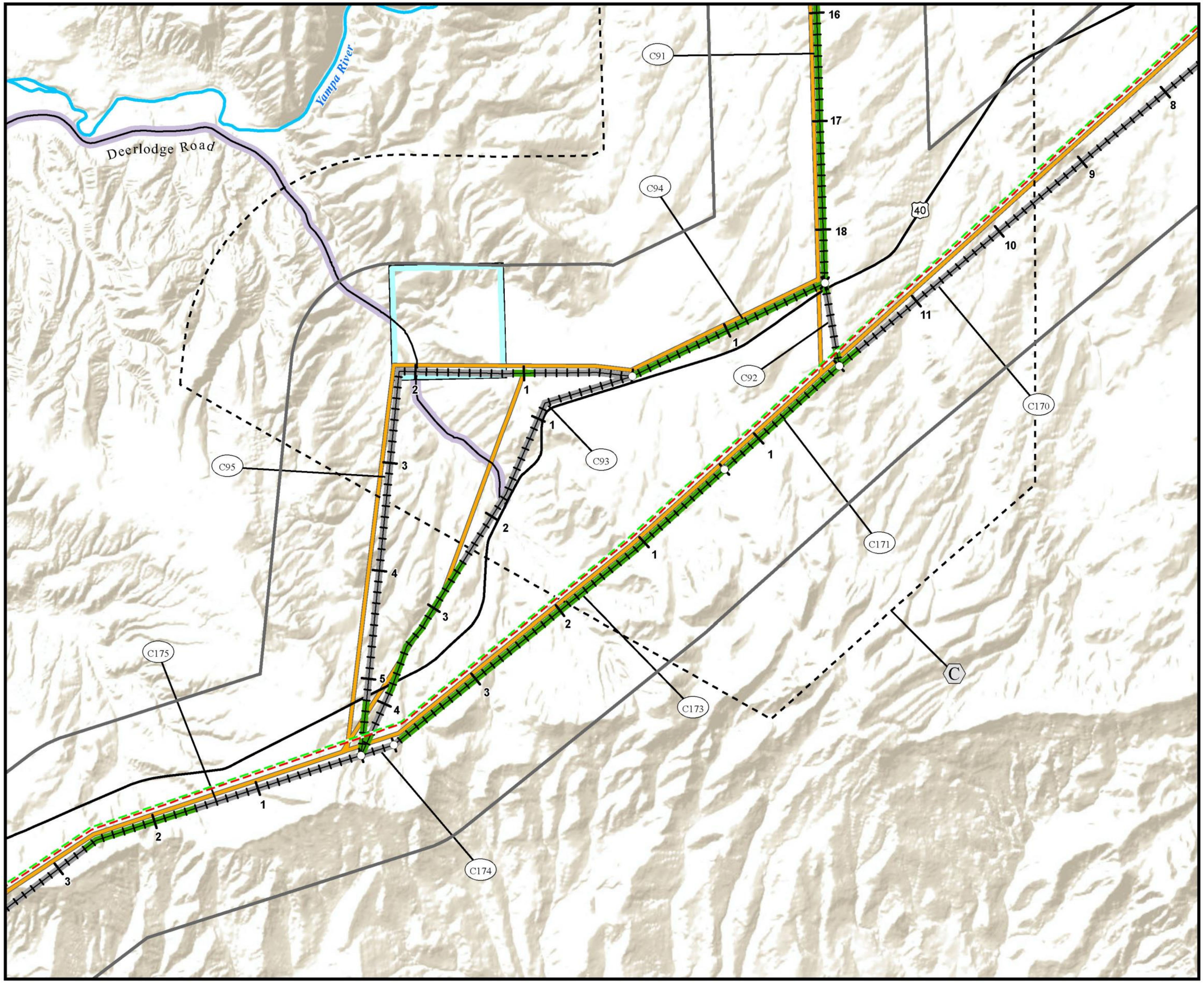

Map G-13

Future Land Use

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Proposed Activities[1]

🟧 Proposed TransWest Express Transmission Line

Residual Impact Levels

🟥 High
🟦 Moderate
🟩 Low
▬ No Identifiable

Project Features

▭ Study Corridor
○ Link Node
┼┼┼ 5 Alternative Route (with Milepost Identifier)
⬡ Series Compensation Station Siting Area
⬭ Link Number

Land Ownership

▭ State Land[2] (where Deerlodge Road crosses)
▬ Dinosaur National Monument

General Reference

- - 345kV Transmission Line
- - 138kV Transmission Line
〰 River or Stream
— U.S. Highway
— Other Road

SOURCES:
TransWest Express Transmission Line, AECOM 2014;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] Only proposed activities that intersect the 2-mile-wide study corridor are displayed on this map.

[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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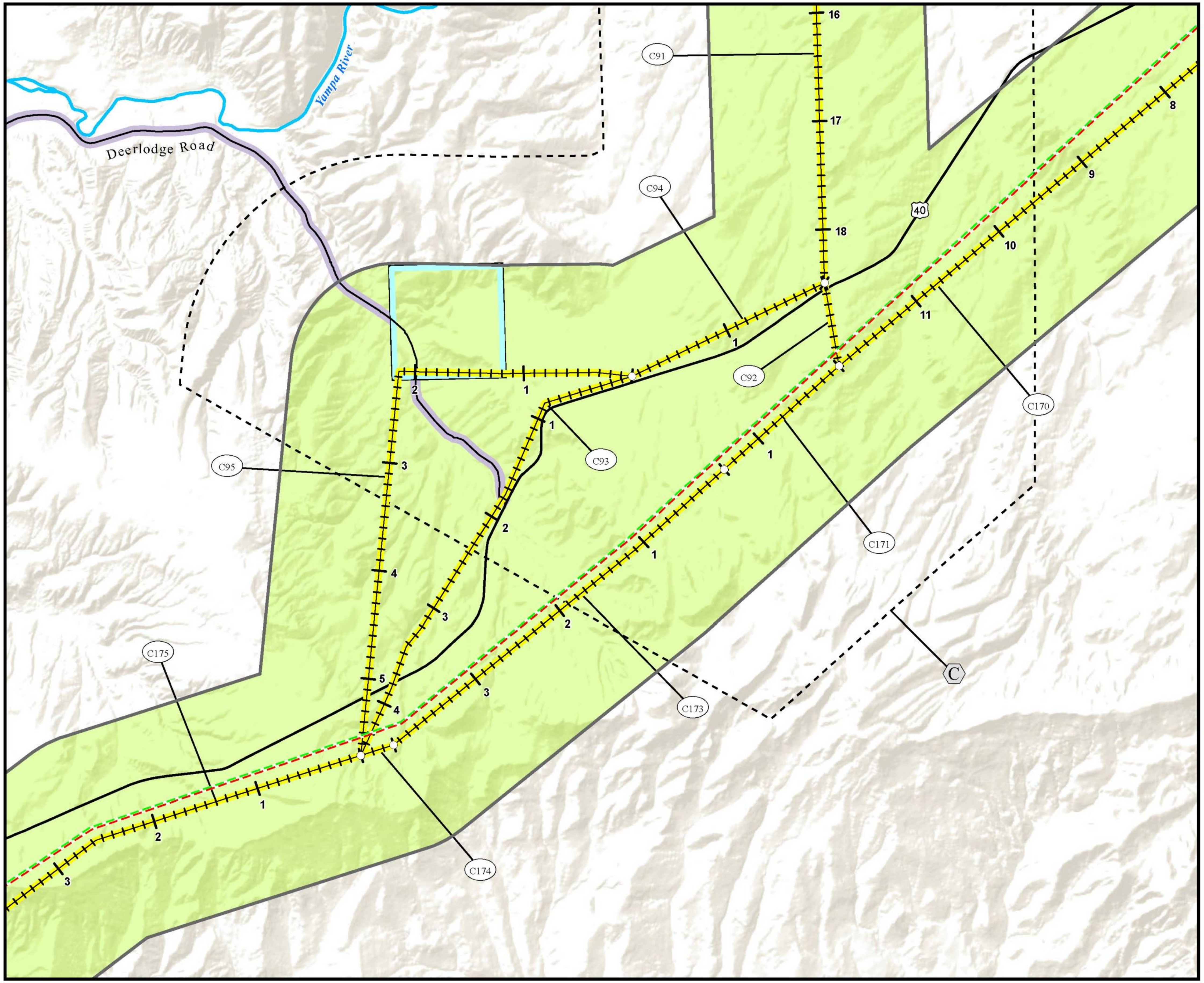

Map G-14

Zoning and General Plan Management Direction

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Generalized Zoning[1, 2]

🟩 Agriculture - Moffat County Zone A

Generalized Permitting[3]

🟥 Not Permitted
🟩 Permitted
🟨 Conditionally Permitted

Project Features

Study Corridor
○ Link Node
Alternative Route (with Milepost Identifier)
Series Compensation Station Siting Area
Link Number

Land Ownership

State Land[4] (where Deerlodge Road crosses)
Dinosaur National Monument

General Reference

345kV Transmission Line
U.S. Highway
138kV Transmission Line
Other Road
River or Stream

SOURCES:
Planned Land Use Zoning, Moffat County 2009;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] Generalized zoning is only shown within the 2-mile-wide land use study corridor.

[2] The EPG 2011 Zoning and General Plan Management Direction layer was created using a combination of general plans and zoning ordinances for all counties and cities within the 2-mile-wide land use study corridor.

[3] Generalized permitting is based on review of city and county zoning and general plan management direction. The ultimate decision to permit the project within the jurisdictions crossed will be made by the applicable state, city, or county. The generalized permitting is for disclosure and comparison purposes only.

[4] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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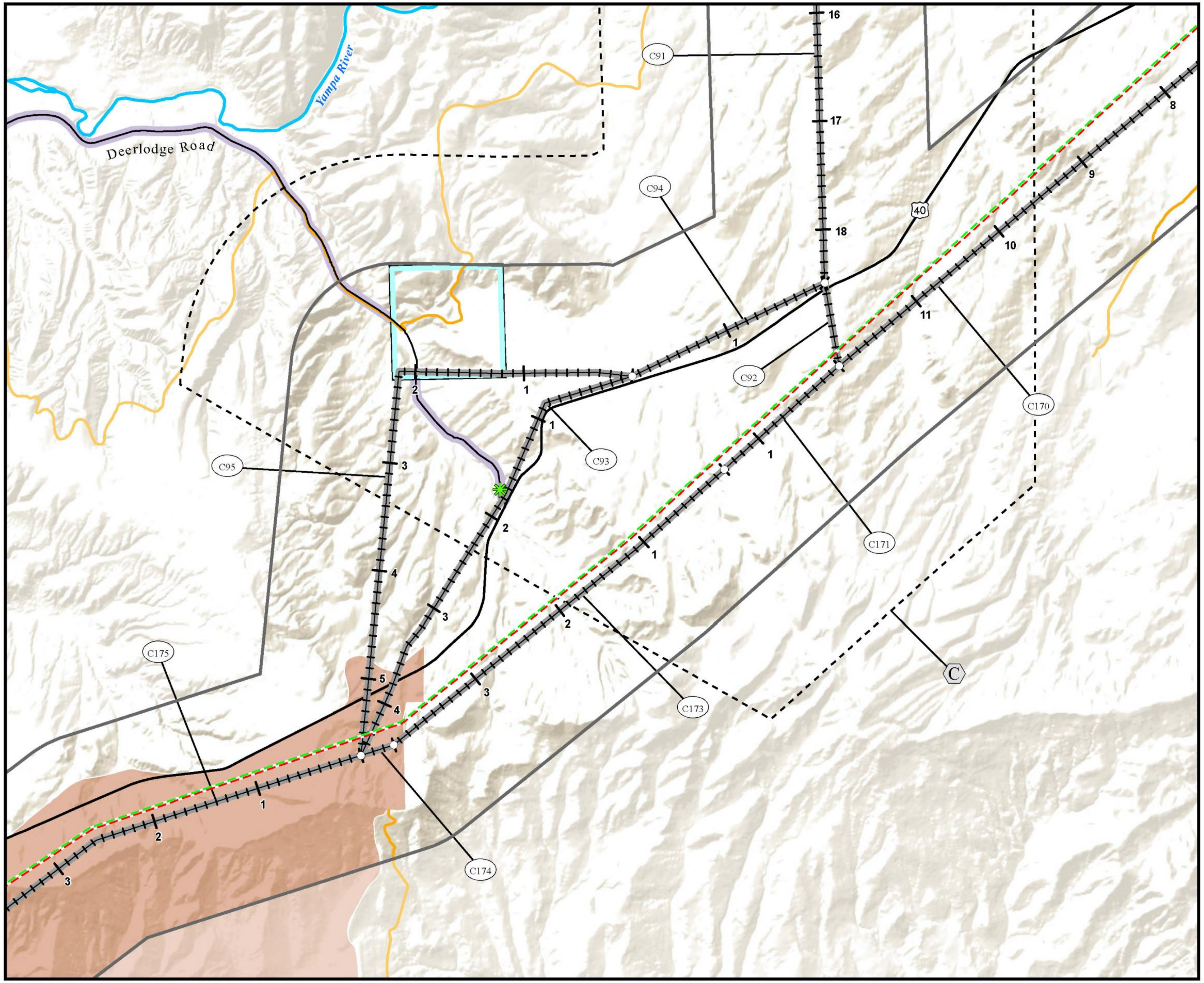

Map G-15

Parks, Preservation, and Recreation

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Recreation Resources[1]

- Motorized Trail
- Dinosaur National Monument Information Kiosk

Recreation Opportunity Spectrum[1]

- Semi-Primitive Motorized/Front/Middle Country

Residual Impact Levels

- High
- Moderate
- Low
- No Identifiable

Project Features

- Study Corridor
- Alternative Route (with Milepost Identifier)
- Link Number
- Link Node
- Series Compensation Station Siting Area

Land Ownership

- State Land[2] (where Deerlodge Road crosses)
- Dinosaur National Monument

General Reference

- 345kV Transmission Line
- 138kV Transmission Line
- River or Stream
- U.S. Highway
- Other Road

SOURCES:
Recreation Trails, BLM 2011; Dinosaur National Monument Information Kiosk, EPG 2012;
Recreation Opportunity Spectrum, BLM 2011;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] Only recreation resources and the recreation opportunity spectrum classes that intersect the 2-mile-wide land use study corridor are shown on this map.

[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.
- The Recreation Opportunity Spectrum was not assessed using impact levels. Instead, these areas are discussed in terms of miles the Project would cross and a qualitative discussion of how this crossing may affect the management prescriptions and relevant/important values or special characteristics of these designations.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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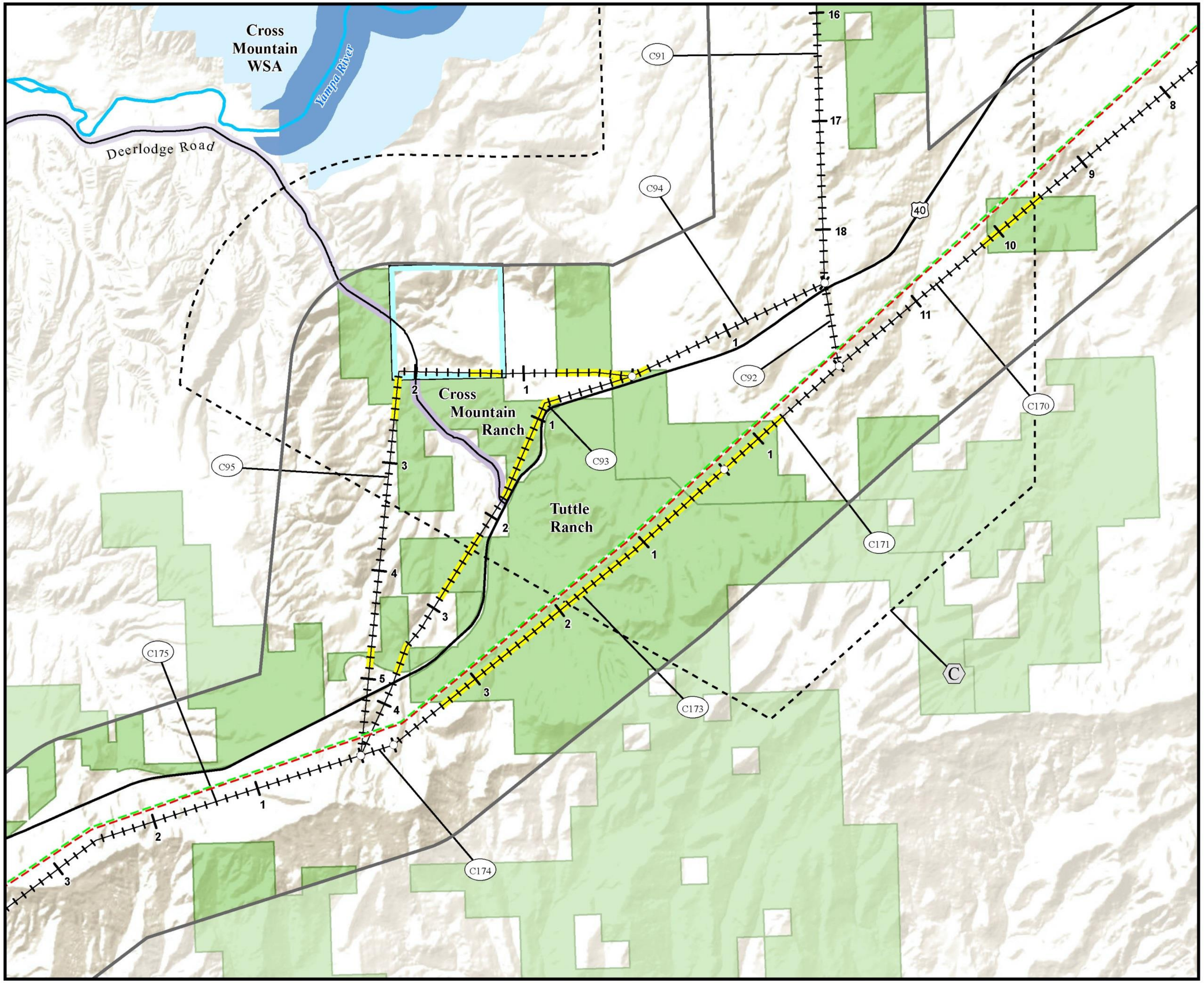

Map G-16

Congressional Designations, Special Designations, and Other Management Areas

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

Congressional Designations

- 🟦 Wild and Scenic River (Suitable)
- 🟦 Wilderness Study Area (WSA)

Special Designations and Other Management Areas

- 🟩 Tuttle Ranch and Cross Mountain Ranch Conservation Easments

Area Crossed by Project

- 🟨 Area Crossed by Project

Project Features

- ▭ Study Corridor
- ○ Link Node
- 5 Alternative Route (with Milepost Identifier)
- Ⓐ Series Compensation Station Siting Area
- Link Number

Land Ownership

- ▭ State Land[1] (where Deerlodge Road crosses)
- 🟪 Dinosaur National Monument

General Reference

- 345kV Transmission Line
- U.S. Highway
- 138kV Transmission Line
- Other Road
- River or Stream

SOURCES:
Wild and Scenic Rivers, BLM 2011; Wilderness Study Areas, BLM 2012;
Conservation Easements, CPW 2013, BLM 2015;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

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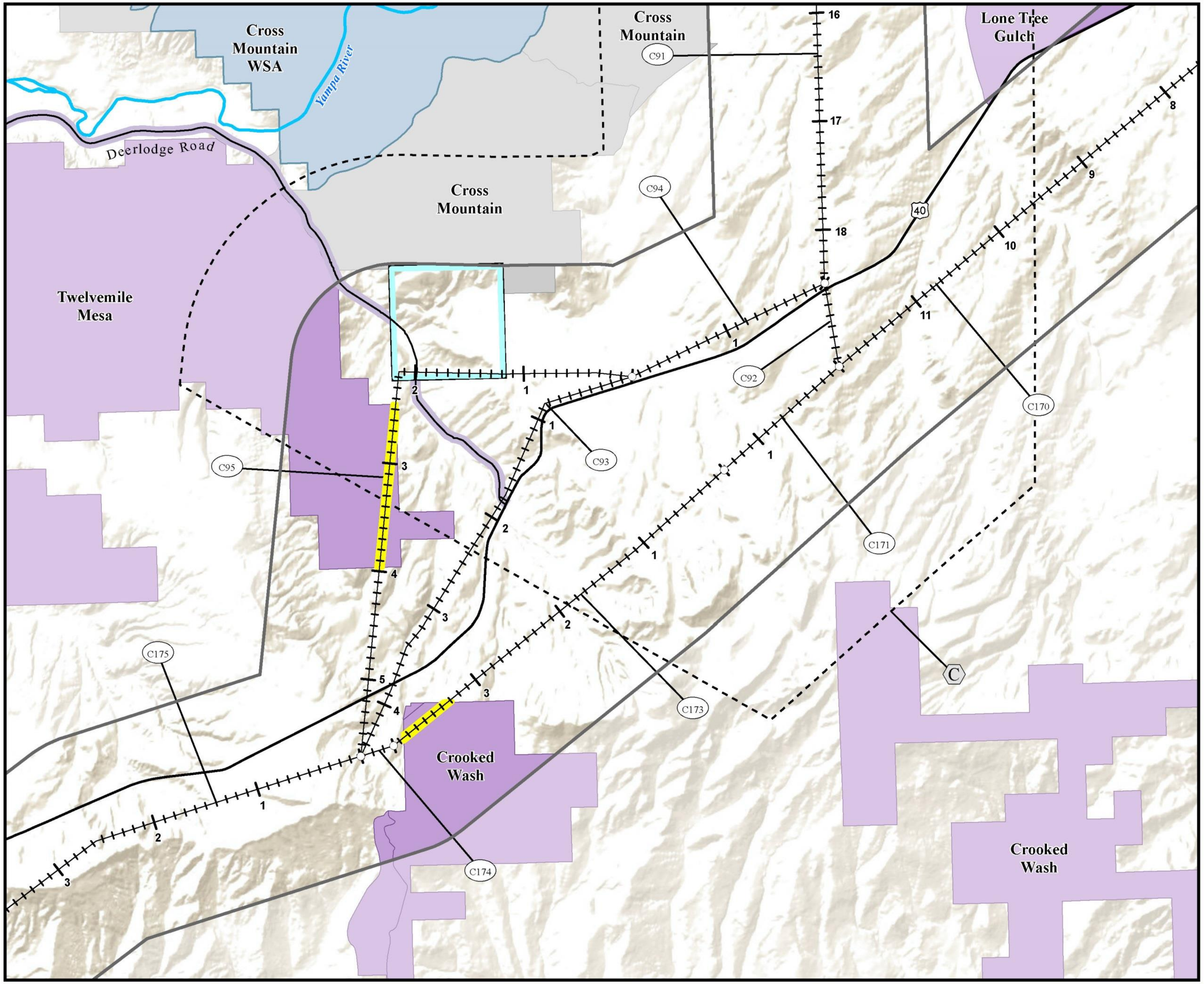

Map G-17

Wilderness Study Areas and Lands with Wilderness Characteristics

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Wilderness Study Areas

🟦 Wilderness Study Area (WSA)

Lands With Wilderness Characteristic Units

🟪 Inventoried Lands with Wilderness Characteristics Pending Planning Process Review

⬜ Lands Inventoried - No Wilderness Characteristics Identified

Area Crossed by Project

🟨 Area Crossed by Project

Project Features

▭ Study Corridor

○ Link Node

5 Alternative Route (with Milepost Identifier)

Series Compensation Station Siting Area

Link Number

Land Ownership

▭ State Land[1] (where Deerlodge Road crosses)

🟪 Dinosaur National Monument

General Reference

– – 345kV Transmission Line

— U.S. Highway

– – 138kV Transmission Line

— Other Road

River or Stream

SOURCES:
Wilderness Study Areas, BLM 2012;
Lands with Wilderness Characteristics, BLM 2013;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

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Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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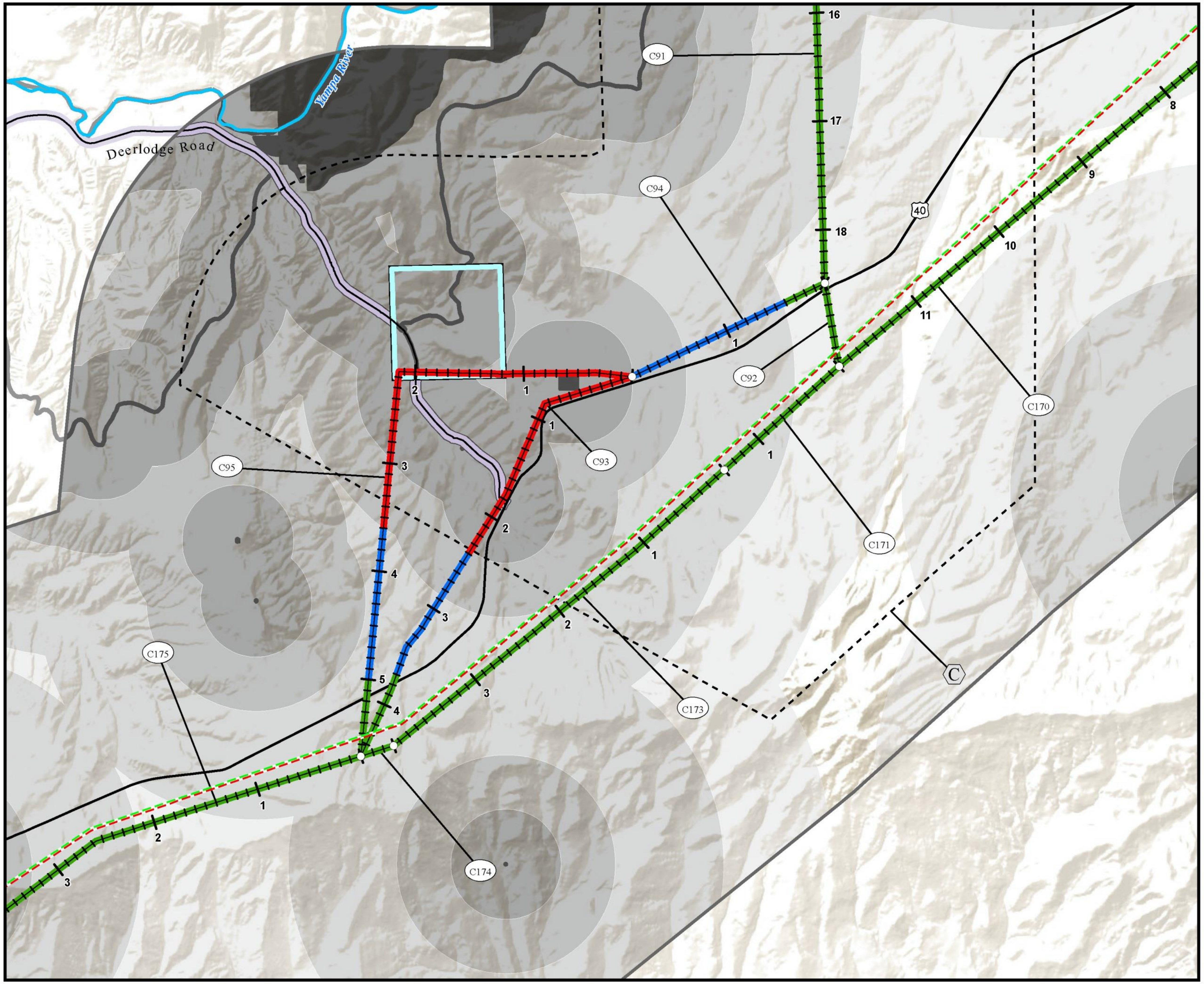

Map G-18

High Concern Viewers

ENERGY GATEWAY SOUTH TRANSMISSION PROJECT

High Concern Viewers[1]

HIGH CONCERN VIEWERS
- High Concern Level Viewer

INFLUENCE ZONES
- 0 to 0.5 mile
- 0.5 to 1.0 mile
- 1.0 to 2.0 miles
- 2.0 to 3.0 miles
- Over 3.0 miles

Residual Impact Levels
- High
- Moderate
- Low
- No Identifiable

Project Features
- Study Corridor
- 5 Alternative Route (with Milepost Identifier)
- Link Number
- Link Node
- Series Compensation Station Siting Area

Land Ownership
- State Land[2] (where Deerlodge Road crosses)
- Dinosaur National Monument

General Reference
- 345kV Transmission Line
- 138kV Transmission Line
- River or Stream
- U.S. Highway
- Other Road

SOURCES:
Existing Land Use as digitized by EPG, NAIP 2011, 2012, 2013, Bing 2014;
Visually Sensitive Travel Routes as digitized by EPG, NAIP 2011, ESRI 2008;
Visually Sensitive Waterways and Water Bodies, USGS 2011;
Recreation Trails, BLM 2012; Wilderness Study Areas, BLM 2012;
Wild and Scenic Rivers, BLM 2011;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] High concern viewers and influence zones are only shown within the 6-mile-wide visual resources study corridor.

[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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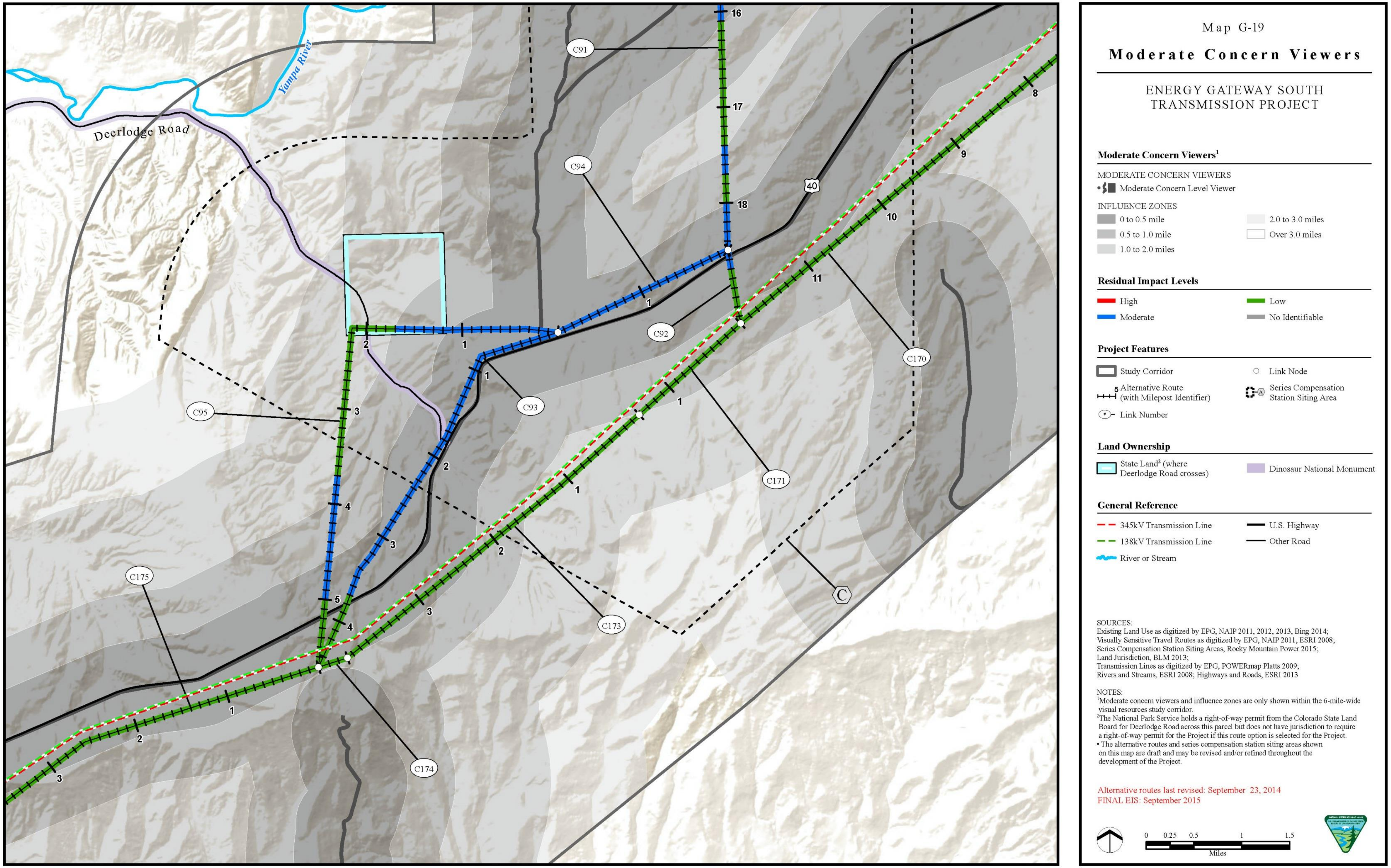

Map G-19

Moderate Concern Viewers

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Moderate Concern Viewers[1]

MODERATE CONCERN VIEWERS
- Moderate Concern Level Viewer

INFLUENCE ZONES

▨ 0 to 0.5 mile	▨ 2.0 to 3.0 miles
▨ 0.5 to 1.0 mile	☐ Over 3.0 miles
▨ 1.0 to 2.0 miles	

Residual Impact Levels

🟥 High	🟩 Low
🟦 Moderate	▨ No Identifiable

Project Features

Study Corridor	○ Link Node
Alternative Route (with Milepost Identifier)	Series Compensation Station Siting Area
Link Number	

Land Ownership

State Land[2] (where Deerlodge Road crosses)	Dinosaur National Monument

General Reference

345kV Transmission Line	U.S. Highway
138kV Transmission Line	Other Road
River or Stream	

SOURCES:
Existing Land Use as digitized by EPG, NAIP 2011, 2012, 2013, Bing 2014;
Visually Sensitive Travel Routes as digitized by EPG, NAIP 2011, ESRI 2008;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] Moderate concern viewers and influence zones are only shown within the 6-mile-wide visual resources study corridor.
[2] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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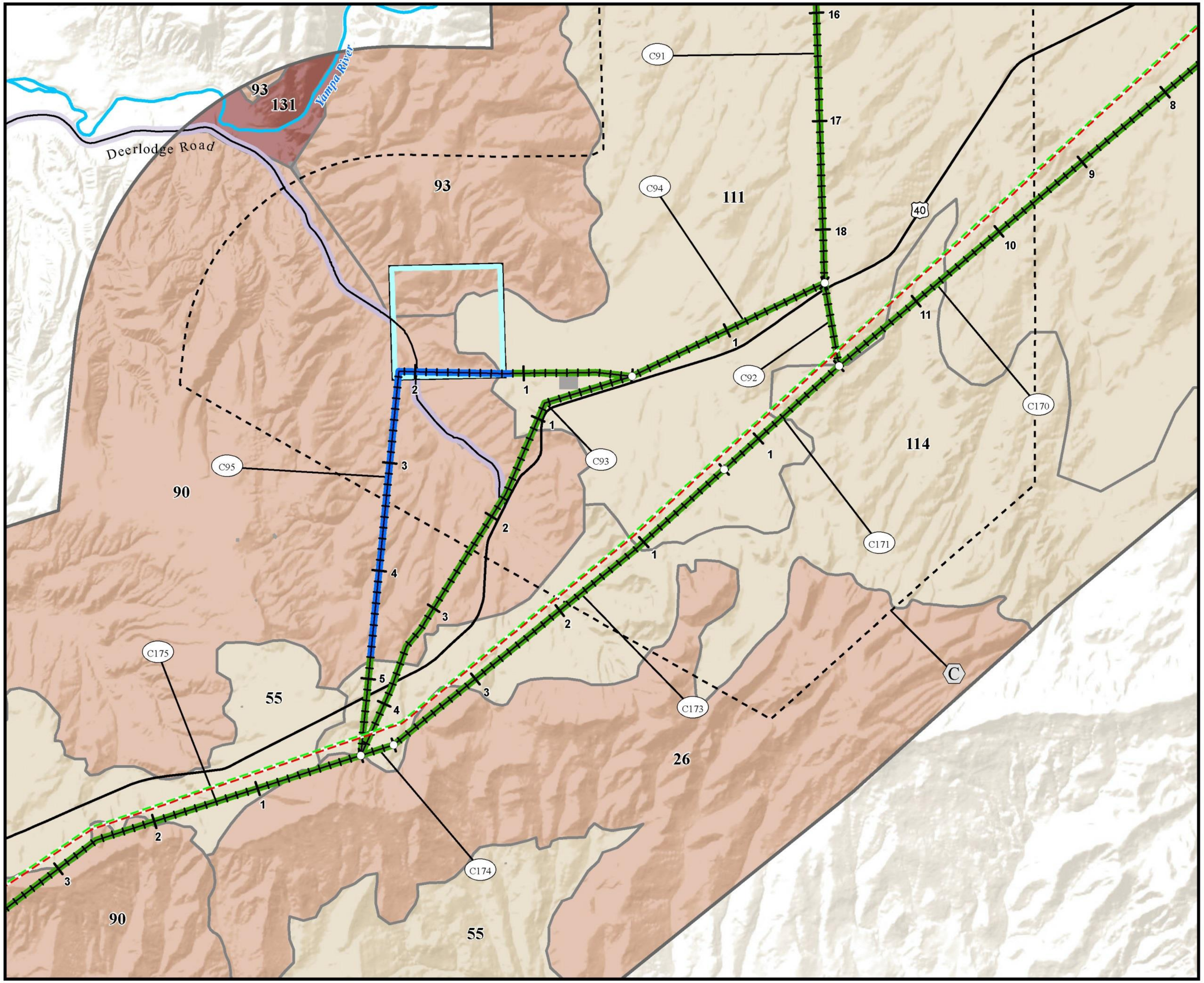

Map G-20

Scenery

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Project-Level Scenery Rating Units[1]

▨ Class A[2]
131 - Yampa River Canyons

▨ Class B[2]
26 - Foothills (WB)
90 - Arid Juniper Hills (UB)
93 - Cross Mountain

▨ Class C[2]
111 - Rolling Steppe
114 - Sagebrush Hills (WB)
55 - Sagebrush Valley (UB)

▨ Developed[2]

Residual Impact Levels

🟥 High
🟦 Moderate
🟩 Low
▨ No Identifiable

Project Features

Study Corridor
Alternative Route (with Milepost Identifier)
Link Number
Link Node
Series Compensation Station Siting Area

Land Ownership

State Land[3] (where Deerlodge Road crosses)
Dinosaur National Monument

General Reference

345kV Transmission Line
138kV Transmission Line
River or Stream
U.S. Highway
Other Road

SOURCES:
Project-level Scenery Rating Units as digitized by EPG, NAIP 2012;
Existing Land Use as digitized by EPG, NAIP 2011, 2012, 2013, Bing 2014;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:
[1] Project-level scenery rating units and areas of development are only shown within the 6-mile-wide visual resources study corridor.
[2] The following acronyms correspond to physiographic provinces and sections as described in Physiography of Western United States (Fenneman 1931):
UB = Uinta Basin physiographic section
WB = Wyoming Basin physiographic province
[3] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.
- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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Miles

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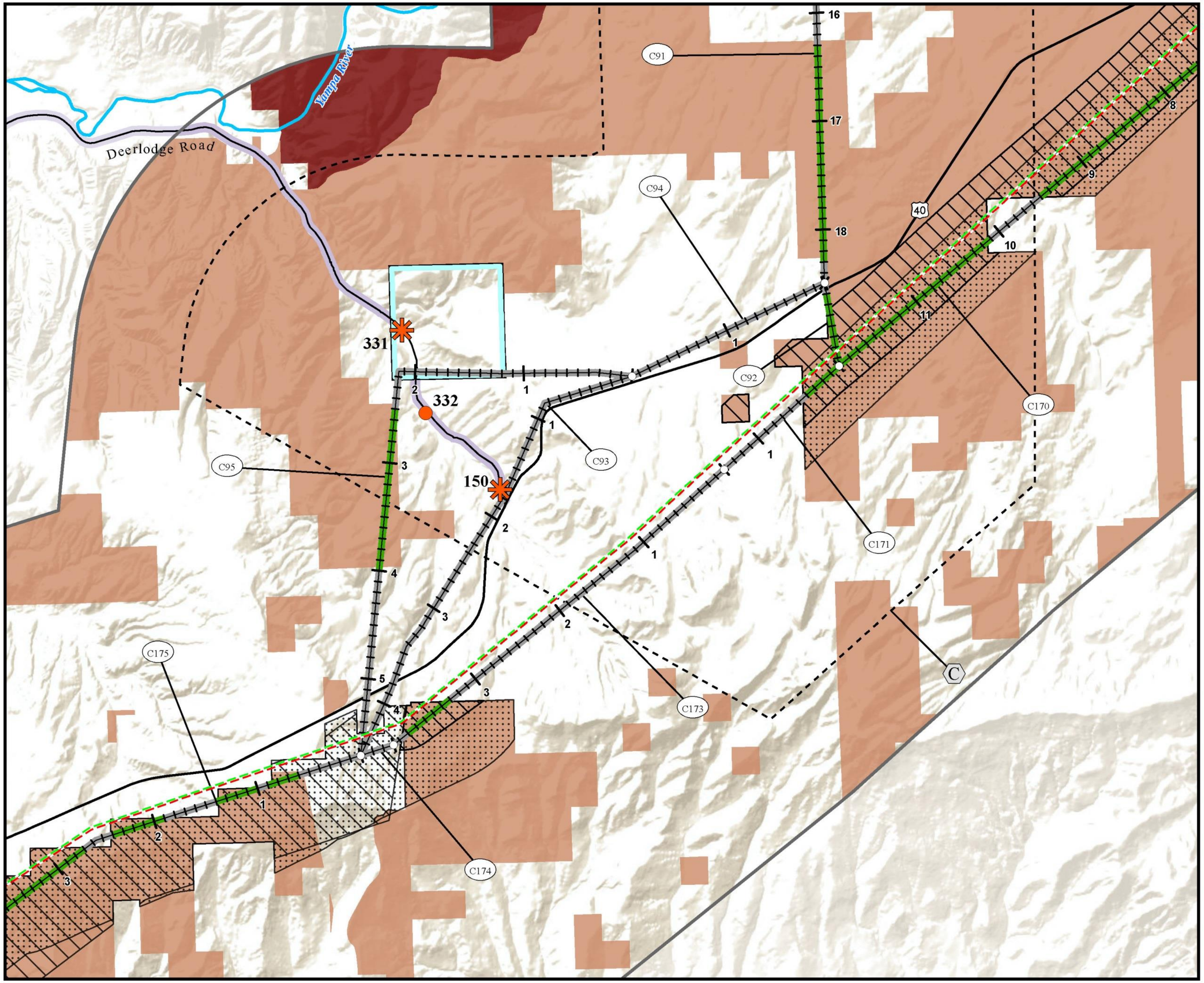

Map G-21

Federal Agency Visual Management Objectives

ENERGY GATEWAY SOUTH
TRANSMISSION PROJECT

Federal Agency Visual Management Objectives[1]

KEY OBSERVATION POINT (KOP) AND SIMULATION LOCATIONS[2]

KOP/Simulation Location
KOP Location

BLM VISUAL RESOURCE MANAGEMENT OBJECTIVES CLASS[3]

Class I
Class III

FEDERAL SURFACE UTILITY CORRIDORS[4]

West-wide Energy Corridor
Designated Utility Corridor

Residual Impact Levels

Compliant/Consistent
Not Applicable
Not Compliant/Not Consistent

Project Features

Study Corridor
Link Node
Alternative Route (with Milepost Identifier)
Series Compensation Station Siting Area
Link Number

Land Ownership

State Land[5] (where Deerlodge Road crosses)
Dinosaur National Monument

General Reference

345kV Transmission Line
U.S. Highway
138kV Transmission Line
Other Road
River or Stream

SOURCES:
Key Observation Points and Simulation Locations, EPG 2012;
VRM, BLM 1987, 1990, 2008, 2011, 2013;
West-wide Energy Corridors, Argonne National Laboratory 2008;
RMP Utility Corridors as digitized by EPG, BLM 1987, 1989, 1990, 1997, 2008, 2011;
Series Compensation Station Siting Areas, Rocky Mountain Power 2015;
Land Jurisdiction, BLM 2013;
Transmission Lines as digitized by EPG, POWERmap Platts 2009;
Rivers and Streams, ESRI 2008; Highways and Roads, ESRI 2013

NOTES:

[1] BLM VRM classes and federal surface utility corridors are only shown within the 6-mile-wide visual resources study corridor.

[2] KOP names and associated contrast rating worksheets can be found in Appendix N.

[3] No VRM Class II or IV lands are located in this portion of the visual resources study corridor.

[4] Designated utility corridors are from BLM resource management plans and resource management plans.

[5] The National Park Service holds a right-of-way permit from the Colorado State Land Board for Deerlodge Road across this parcel but does not have jurisdiction to require a right-of-way permit for the Project if this route option is selected for the Project.

- The alternative routes and series compensation station siting areas shown on this map are draft and may be revised and/or refined throughout the development of the Project.

Alternative routes last revised: September 23, 2014
FINAL EIS: September 2015

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Appendix H

Climate and Air Quality Supporting Data

APPENDIX H – CLIMATE AND AIR QUALITY SUPPORTING DATA

H.1 Emissions Summary Tables – Transmission Line and Series Compensation Station Construction

TABLE H-1
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION
FOR ALTERNATIVE WYCO-B (AGENCY AND APPLICANT PREFERRED ALTERNATIVE)

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	127.30	157.3	0.00	1.390
$PM_{2.5}$	12.70	15.7	0.00	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,444.80	4,570.1	965.30	39.020
$PM_{2.5}$	246.00	459.9	97.10	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,522.80	4,404.4	895.60	38.250
$PM_{2.5}$	253.90	443.2	90.10	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	26.80	54.7	6.60	0.430
NO_x	24.20	49.6	5.90	0.390
PM_{10}	1.60	3.2	0.40	0.030
$PM_{2.5}$	1.60	3.2	0.40	0.030
SO_2	0.10	0.3	0.03	0.002
VOC	1.80	3.8	0.40	0.030
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	25.70	43.8	5.10	0.370
NO_x	23.10	38.9	4.50	0.320
PM_{10}	1.60	2.6	0.30	0.020
$PM_{2.5}$	1.60	2.6	0.30	0.020
SO_2	0.10	0.2	0.02	0.002
VOC	1.80	3.0	0.30	0.020
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.20	2.2	0.40	0.010
NO_x	0.30	3.1	0.50	0.020
PM_{10}	0.01	0.1	0.02	0.001
$PM_{2.5}$	0.01	0.1	0.02	0.001
SO_2	0.04	0.4	0.10	0.003
VOC	0.20	1.8	0.30	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	1.30	2.3	0.40	0.020
NO_x	2.20	3.4	0.50	0.030
PM_{10}	0.10	0.1	0.02	0.001
$PM_{2.5}$	0.10	0.1	0.02	0.001
SO_2	0.30	0.4	0.10	0.004
VOC	1.00	1.9	0.30	0.020

TABLE H-1
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION
FOR ALTERNATIVE WYCO-B (AGENCY AND APPLICANT PREFERRED ALTERNATIVE)

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.90	5.8	0.80	0.050
NO_x	5.70	11.5	1.60	0.090
PM_{10}	0.40	0.8	0.10	0.010
$PM_{2.5}$	0.30	0.6	0.10	0.010
SO_2	0.04	0.1	0.01	0.001
VOC	0.90	1.6	0.30	0.010
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	2.90	5.4	0.70	0.040
NO_x	5.80	10.9	1.50	0.090
PM_{10}	0.40	0.7	0.10	0.010
$PM_{2.5}$	0.30	0.6	0.10	0.005
SO_2	0.04	0.1	0.01	0.001
VOC	0.90	1.5	0.30	0.010

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-2
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION
FOR ALTERNATIVE WYCO-C

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	130.20	160.90	0.00	1.380
$PM_{2.5}$	13.00	16.10	0.00	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,515.30	4,701.90	993.10	39.020
$PM_{2.5}$	253.10	473.10	99.90	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,595.50	4,531.50	921.50	38.250
$PM_{2.5}$	261.20	456.00	92.70	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	27.60	56.30	6.70	0.430
NO_x	24.90	51.00	6.10	0.390
PM_{10}	1.70	3.30	0.40	0.030
$PM_{2.5}$	1.70	3.30	0.40	0.030
SO_2	0.10	0.30	0.03	0.002
VOC	1.90	3.90	0.50	0.030

TABLE H-2
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-C

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	26.40	45.10	5.30	0.370
NO_x	23.80	40.00	4.60	0.320
PM_{10}	1.60	2.70	0.30	0.020
$PM_{2.5}$	1.60	2.70	0.30	0.020
SO_2	0.10	0.20	0.02	0.002
VOC	1.80	3.10	0.30	0.020
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.20	2.20	0.40	0.010
NO_x	0.30	3.20	0.50	0.020
PM_{10}	0.01	0.10	0.02	0.001
$PM_{2.5}$	0.01	0.10	0.02	0.001
SO_2	0.04	0.40	0.10	0.003
VOC	0.20	1.80	0.30	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	1.30	2.40	0.40	0.020
NO_x	2.20	3.50	0.50	0.030
PM_{10}	0.10	0.10	0.02	0.001
$PM_{2.5}$	0.10	0.10	0.02	0.001
SO_2	0.30	0.50	0.10	0.004
VOC	1.00	2.00	0.30	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.90	6.00	0.80	0.050
NO_x	5.90	11.80	1.60	0.090
PM_{10}	0.40	0.80	0.10	0.010
$PM_{2.5}$	0.30	0.60	0.10	0.010
SO_2	0.04	0.10	0.01	0.001
VOC	0.90	1.70	0.30	0.010
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	3.00	5.60	0.80	0.040
NO_x	5.90	11.20	1.50	0.090
PM_{10}	0.40	0.70	0.10	0.010
$PM_{2.5}$	0.30	0.60	0.10	0.005
SO_2	0.04	0.06	0.01	0.001
VOC	0.90	1.60	0.30	0.010

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-3
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-D

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	153.60	189.8	0.0	1.370
$PM_{2.5}$	15.40	19.0	0.0	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,988.70	5,586.9	1,180.1	39.020
$PM_{2.5}$	300.70	562.2	118.7	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	3,084.10	5,384.4	1,094.9	38.250
$PM_{2.5}$	310.30	541.8	110.2	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	32.80	66.8	8.00	0.430
NO_x	29.60	60.6	7.20	0.390
PM_{10}	2.00	3.9	0.50	0.030
$PM_{2.5}$	2.00	3.9	0.50	0.030
SO_2	0.10	0.3	0.03	0.002
VOC	2.30	4.6	0.50	0.030
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	31.40	53.6	6.30	0.370
NO_x	28.20	47.5	5.50	0.320
PM_{10}	1.90	3.2	0.40	0.020
$PM_{2.5}$	1.90	3.2	0.40	0.020
SO_2	0.10	0.3	0.03	0.002
VOC	2.20	3.6	0.40	0.020
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.30	2.7	0.40	0.010
NO_x	0.40	3.8	0.60	0.020
PM_{10}	0.01	0.1	0.02	0.001
$PM_{2.5}$	0.01	0.1	0.02	0.001
SO_2	0.10	0.5	0.10	0.003
VOC	0.20	2.2	0.40	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	1.50	2.9	0.40	0.020
NO_x	2.60	4.2	0.60	0.030
PM_{10}	0.10	0.1	0.02	0.001
$PM_{2.5}$	0.10	0.1	0.02	0.001
SO_2	0.30	0.5	0.10	0.004
VOC	1.20	2.3	0.40	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	3.50	7.1	1.00	0.050
NO_x	7.00	14.0	1.90	0.090
PM_{10}	0.50	0.9	0.10	0.010
$PM_{2.5}$	0.40	0.8	0.10	0.010
SO_2	0.10	0.1	0.02	0.001
VOC	1.10	2.0	0.30	0.010

TABLE H-3
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-D

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	3.50	6.6	0.90	0.040
NO_x	7.10	13.3	1.80	0.090
PM_{10}	0.50	0.9	0.10	0.010
$PM_{2.5}$	0.40	0.7	0.10	0.005
SO_2	0.10	0.1	0.02	0.001
VOC	1.10	1.9	0.30	0.010

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide

NO_x = Nitrogen oxides

$PM_{2.5}$ = Particulate matter less than 2.5 micrometers

PM_{10} = Particulate matter less than 10 micrometers

SO_2 = Sulfur dioxide

VOC = Volatile organic compounds

TABLE H-4
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-F

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	135.10	166.9	0.00	1.380
$PM_{2.5}$	13.50	16.7	0.00	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,616.90	4,891.9	1,033.30	39.020
$PM_{2.5}$	263.30	492.2	104.00	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,700.40	4,714.5	958.70	38.250
$PM_{2.5}$	271.70	474.4	96.50	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	28.70	58.5	7.00	0.430
NO_x	25.90	53.1	6.30	0.390
PM_{10}	1.70	3.4	0.40	0.030
$PM_{2.5}$	1.70	3.4	0.40	0.030
SO_2	0.10	0.3	0.03	0.002
VOC	2.00	4.0	0.50	0.030
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	27.50	46.9	5.50	0.370
NO_x	24.70	41.6	4.80	0.320
PM_{10}	1.70	2.8	0.30	0.020
$PM_{2.5}$	1.70	2.8	0.30	0.020
SO_2	0.10	0.2	0.02	0.002
VOC	1.90	3.2	0.40	0.020

TABLE H-4
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-F

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.20	2.3	0.40	0.010
NO_x	0.30	3.4	0.60	0.020
PM_{10}	0.01	0.1	0.02	0.001
$PM_{2.5}$	0.01	0.1	0.02	0.001
SO_2	0.04	0.4	0.10	0.003
VOC	0.20	1.9	0.30	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	1.30	2.5	0.40	0.020
NO_x	2.30	3.7	0.60	0.030
PM_{10}	0.10	0.1	0.02	0.001
$PM_{2.5}$	0.10	0.1	0.02	0.001
SO_2	0.30	0.5	0.10	0.004
VOC	1.10	2.0	0.30	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	3.10	6.2	0.90	0.050
NO_x	6.10	12.3	1.70	0.090
PM_{10}	0.40	0.8	0.10	0.010
$PM_{2.5}$	0.30	0.7	0.10	0.010
SO_2	0.05	0.1	0.01	0.001
VOC	1.00	1.7	0.30	0.010
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	3.10	5.8	0.80	0.040
NO_x	6.20	11.6	1.60	0.090
PM_{10}	0.40	0.8	0.10	0.010
$PM_{2.5}$	0.30	0.6	0.10	0.005
SO_2	0.05	0.1	0.01	0.001
VOC	1.00	1.6	0.30	0.010

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-5
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-B

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM$_{10}$	130.5	260.9	25.10	1.490
PM$_{2.5}$	13.0	26.1	2.50	0.150
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM$_{10}$	3,337.8	6,239.4	1,317.90	39.020
PM$_{2.5}$	335.9	627.8	132.60	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM$_{10}$	3,444.3	6,013.3	1,222.80	38.250
PM$_{2.5}$	346.6	605.1	123.00	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	68.7	149.5	20.20	0.850
NO$_x$	29.4	83.4	18.30	0.470
PM$_{10}$	2.7	6.6	1.20	0.040
PM$_{2.5}$	2.7	6.6	1.20	0.040
SO$_2$	0.1	0.4	0.10	0.002
VOC	5.4	11.3	1.40	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	68.4	140.2	20.20	0.820
NO$_x$	29.1	74.2	18.30	0.440
PM$_{10}$	2.6	6.1	1.20	0.040
PM$_{2.5}$	2.6	6.1	1.20	0.040
SO$_2$	0.1	0.3	0.10	0.002
VOC	5.4	10.7	1.40	0.060
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.0	2.5	1.40	0.010
NO$_x$	0.0	3.6	2.00	0.020
PM$_{10}$	0.0	0.1	0.10	0.001
PM$_{2.5}$	0.0	0.1	0.10	0.001
SO$_2$	0.0	0.5	0.30	0.003
VOC	0.0	2.0	1.10	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.0	4.1	1.40	0.020
NO$_x$	0.0	6.5	2.00	0.030
PM$_{10}$	0.0	0.2	0.10	0.001
PM$_{2.5}$	0.0	0.2	0.10	0.001
SO$_2$	0.0	0.8	0.30	0.004
VOC	0.0	3.4	1.10	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.9	9.2	2.50	0.050
NO$_x$	6.1	18.7	4.90	0.110
PM$_{10}$	0.4	1.3	0.30	0.010
PM$_{2.5}$	0.3	1.0	0.30	0.010
SO$_2$	0.1	0.1	0.04	0.001
VOC	1.1	2.8	0.80	0.02

TABLE H-5
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-B

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	2.9	8.9	2.30	0.050
NO$_x$	6.1	18.3	4.60	0.100
PM$_{10}$	0.4	1.2	0.30	0.010
PM$_{2.5}$	0.3	1.0	0.30	0.010
SO$_2$	0.1	0.1	0.04	0.001
VOC	1.1	2.7	0.70	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide

NO$_x$ = Nitrogen oxides

PM$_{2.5}$ = Particulate matter less than 2.5 micrometers

PM$_{10}$ = Particulate matter less than 10 micrometers

SO$_2$ = Sulfur dioxide

VOC = Volatile organic compounds

TABLE H-6
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-C

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM$_{10}$	133.1	266.2	25.60	1.470
PM$_{2.5}$	13.3	26.6	2.60	0.150
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM$_{10}$	3,463.3	6,474.1	1,367.50	39.020
PM$_{2.5}$	348.5	651.5	137.60	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM$_{10}$	3,573.8	6,239.4	1,268.80	38.250
PM$_{2.5}$	359.6	627.8	127.70	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	71.3	155.1	21.00	0.850
NO$_x$	30.5	86.5	19.00	0.470
PM$_{10}$	2.8	6.9	1.30	0.040
PM$_{2.5}$	2.8	6.9	1.30	0.040
SO$_2$	0.1	0.4	0.10	0.002
VOC	5.6	11.8	1.40	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	70.9	145.4	21.00	0.820
NO$_x$	30.2	77.0	19.00	0.440
PM$_{10}$	2.7	6.3	1.30	0.040
PM$_{2.5}$	2.7	6.3	1.30	0.040
SO$_2$	0.1	0.4	0.10	0.002
VOC	5.6	11.1	1.40	0.060

TABLE H-6
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-C

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.0	2.6	1.40	0.010
NO_x	0.0	3.7	2.10	0.020
PM_{10}	0.0	0.1	0.10	0.001
$PM_{2.5}$	0.0	0.1	0.10	0.001
SO_2	0.0	0.5	0.30	0.003
VOC	0.0	2.1	1.20	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.0	4.3	1.40	0.020
NO_x	0.0	6.8	2.10	0.030
PM_{10}	0.0	0.2	0.10	0.001
$PM_{2.5}$	0.0	0.2	0.10	0.001
SO_2	0.0	0.8	0.30	0.004
VOC	0.0	3.5	1.20	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	3.0	9.5	2.60	0.050
NO_x	6.4	19.4	5.00	0.110
PM_{10}	0.4	1.3	0.30	0.010
$PM_{2.5}$	0.4	1.1	0.30	0.010
SO_2	0.1	0.1	0.04	0.001
VOC	1.1	2.9	0.80	0.020
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	3.0	9.2	2.40	0.050
NO_x	6.4	19.0	4.70	0.100
PM_{10}	0.4	1.3	0.30	0.010
$PM_{2.5}$	0.4	1.0	0.30	0.010
SO_2	0.1	0.1	0.04	0.001
VOC	1.1	2.8	0.80	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-7
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION
FOR ALTERNATIVE COUT BAX-E

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	129.9	259.8	25.00	1.420
$PM_{2.5}$	13.0	26.0	2.50	0.140
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	3,484.9	6,514.3	1,376.00	39.020
$PM_{2.5}$	350.7	655.5	138.50	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	3,596.0	6.278.2	1,276.60	38.250
$PM_{2.5}$	361.8	631.7	128.50	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	71.7	156.1	21.10	0.850
NO_x	30.7	87.1	19.10	0.470
PM_{10}	2.8	6.9	1.30	0.040
$PM_{2.5}$	2.8	6.9	1.30	0.040
SO_2	0.1	0.4	0.10	0.002
VOC	5.6	11.8	1.40	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	71.4	146.3	21.10	0.820
NO_x	30.4	77.4	19.10	0.440
PM_{10}	2.7	6.4	1.30	0.040
$PM_{2.5}$	2.7	6.4	1.30	0.040
SO_2	0.1	0.4	0.10	0.002
VOC	5.6	11.1	1.40	0.060
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.0	2.6	1.40	0.010
NO_x	0.0	3.7	2.10	0.020
PM_{10}	0.0	0.1	0.10	0.001
$PM_{2.5}$	0.0	0.1	0.10	0.001
SO_2	0.0	0.5	0.30	0.003
VOC	0.0	2.1	1.20	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.0	4.3	1.40	0.020
NO_x	0.0	6.8	2.10	0.030
PM_{10}	0.0	0.2	0.10	0.001
$PM_{2.5}$	0.0	0.2	0.10	0.001
SO_2	0.0	0.8	0.30	0.004
VOC	0.0	3.5	1.20	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	3.0	9.6	2.60	0.050
NO_x	6.4	19.5	5.10	0.110
PM_{10}	0.5	1.3	0.40	0.010
$PM_{2.5}$	0.4	1.1	0.30	0.010
SO_2	0.1	0.1	0.04	0.001
VOC	1.1	2.9	0.80	0.020

TABLE H-7
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-E

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	3.0	9.3	2.40	0.050
NO_x	6.4	19.1	4.80	0.100
PM_{10}	0.5	1.3	0.30	0.010
$PM_{2.5}$	0.4	1.1	0.30	0.010
SO_2	0.1	0.1	0.04	0.001
VOC	1.1	2.9	0.80	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide

NO_x = Nitrogen oxides

$PM_{2.5}$ = Particulate matter less than 2.5 micrometers

PM_{10} = Particulate matter less than 10 micrometers

SO_2 = Sulfur dioxide

VOC = Volatile organic compounds

TABLE H-8
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	102.40	204.8	19.70	1.590
$PM_{2.5}$	10.20	20.5	2.00	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,462.70	4,603.6	972.40	39.020
$PM_{2.5}$	247.80	463.2	97.80	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,541.30	4,436.7	902.20	38.250
$PM_{2.5}$	255.70	446.4	90.80	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	50.70	110.3	14.90	0.850
NO_x	21.70	61.5	13.50	0.470
PM_{10}	2.00	4.9	0.90	0.040
$PM_{2.5}$	2.00	4.9	0.90	0.040
SO_2	0.10	0.3	0.10	0.002
VOC	4.00	8.4	1.00	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	50.40	103.4	14.90	0.820
NO_x	21.50	54.7	13.50	0.440
PM_{10}	1.90	4.5	0.90	0.040
$PM_{2.5}$	1.90	4.5	0.90	0.040
SO_2	0.10	0.3	0.10	0.002
VOC	4.00	7.9	1.00	0.060

TABLE H-8
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.00	1.8	1.00	0.010
NO_x	0.00	2.6	1.50	0.020
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.3	0.20	0.003
VOC	0.00	1.5	0.80	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.00	3.1	1.00	0.020
NO_x	0.00	4.8	1.50	0.030
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.6	0.20	0.004
VOC	0.00	2.5	0.80	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.10	6.8	1.80	0.050
NO_x	4.50	13.8	3.60	0.110
PM_{10}	0.30	0.9	0.20	0.010
$PM_{2.5}$	0.30	0.8	0.20	0.010
SO_2	0.04	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	2.10	6.6	1.70	0.050
NO_x	4.50	13.5	3.40	0.100
PM_{10}	0.30	0.9	0.20	0.010
$PM_{2.5}$	0.30	0.7	0.20	0.010
SO_2	0.04	0.1	0.03	0.001
VOC	0.80	2.0	0.50	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide

NO_x = Nitrogen oxides

$PM_{2.5}$ = Particulate matter less than 2.5 micrometers

PM_{10} = Particulate matter less than 10 micrometers

SO_2 = Sulfur dioxide

VOC = Volatile organic compounds

TABLE H-9
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	106.40	212.7	20.50	1.570
$PM_{2.5}$	10.60	21.3	2.00	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,582.30	4,827.1	1,019.60	39.020
$PM_{2.5}$	259.80	485.7	102.60	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,664.60	4,652.1	946.00	38.250
$PM_{2.5}$	268.10	468.1	95.20	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	53.20	115.6	15.70	0.850
NO_x	22.80	64.5	14.20	0.470
PM_{10}	2.10	5.1	0.90	0.040
$PM_{2.5}$	2.10	5.1	0.90	0.040
SO_2	0.10	0.3	0.10	0.002
VOC	4.20	8.8	1.10	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	52.90	108.4	15.70	0.820
NO_x	22.50	57.4	14.20	0.440
PM_{10}	2.00	4.7	0.90	0.040
$PM_{2.5}$	2.00	4.7	0.90	0.040
SO_2	0.10	0.3	0.10	0.002
VOC	4.20	8.2	1.10	0.060
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.00	1.9	1.10	0.010
NO_x	0.00	2.8	1.50	0.020
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.4	0.20	0.003
VOC	0.00	1.5	0.90	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.00	3.2	1.10	0.020
NO_x	0.00	5.1	1.50	0.030
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.6	0.20	0.004
VOC	0.00	2.6	0.90	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.20	7.1	1.90	0.050
NO_x	4.70	14.5	3.80	0.110
PM_{10}	0.30	1.0	0.30	0.010
$PM_{2.5}$	0.30	0.8	0.20	0.010
SO_2	0.05	0.1	0.03	0.001
VOC	0.80	2.2	0.60	0.020

TABLE H-9
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	2.20	6.9	1.80	0.050
NO_x	4.70	14.1	3.50	0.100
PM_{10}	0.30	1.0	0.20	0.010
$PM_{2.5}$	0.30	0.8	0.20	0.010
SO_2	0.05	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-10
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C (AGENCY AND APPLICANT PREFERRED ALTERNATIVE)

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	108.30	216.7	20.80	1.650
$PM_{2.5}$	10.80	21.7	2.10	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,508.10	4,688.5	990.30	39.020
$PM_{2.5}$	252.40	471.8	99.70	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,588.10	4,518.6	918.80	38.250
$PM_{2.5}$	260.40	454.7	92.50	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	51.60	112.3	15.20	0.850
NO_x	22.10	62.7	13.80	0.470
PM_{10}	2.00	5.0	0.90	0.040
$PM_{2.5}$	2.00	5.0	0.90	0.040
SO_2	0.10	0.3	0.10	0.002
VOC	4.10	8.5	1.00	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	51.40	105.3	15.20	0.820
NO_x	21.90	55.7	13.80	0.440
PM_{10}	2.00	4.6	0.90	0.040
$PM_{2.5}$	2.00	4.6	0.90	0.040
SO_2	0.10	0.3	0.10	0.002
VOC	4.00	8.0	1.00	0.060

TABLE H-10
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C (AGENCY AND APPLICANT PREFERRED ALTERNATIVE)

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.00	1.9	1.00	0.010
NO_x	0.00	2.7	1.50	0.020
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.3	0.20	0.003
VOC	0.00	1.5	0.80	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.00	3.1	1.00	0.020
NO_x	0.00	4.9	1.50	0.030
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.6	0.20	0.004
VOC	0.00	2.5	0.80	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.20	6.9	1.90	0.050
NO_x	4.60	14.1	3.70	0.110
PM_{10}	0.30	1.0	0.30	0.010
$PM_{2.5}$	0.30	0.8	0.20	0.010
SO_2	0.04	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	2.20	6.7	1.70	0.050
NO_x	4.60	13.7	3.40	0.100
PM_{10}	0.30	0.9	0.20	0.010
$PM_{2.5}$	0.30	0.8	0.20	0.010
SO_2	0.04	0.1	0.03	0.001
VOC	0.80	2.1	0.60	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide

NO_x = Nitrogen oxides

$PM_{2.5}$ = Particulate matter less than 2.5 micrometers

PM_{10} = Particulate matter less than 10 micrometers

SO_2 = Sulfur dioxide

VOC = Volatile organic compounds

TABLE H-11
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-H

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	99.20	198.4	19.10	1.580
$PM_{2.5}$	9.90	19.8	1.90	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,398.20	4,482.9	946.90	39.020
$PM_{2.5}$	241.30	451.1	95.30	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,474.70	4,320.4	878.50	38.250
$PM_{2.5}$	249.00	434.7	88.40	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	49.40	107.4	14.50	0.850
NO_x	21.10	59.9	13.20	0.470
PM_{10}	1.90	4.8	0.90	0.040
$PM_{2.5}$	1.90	4.8	0.90	0.040
SO_2	0.10	0.3	0.10	0.002
VOC	3.90	8.1	1.00	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	49.10	100.7	14.50	0.820
NO_x	20.90	53.3	13.20	0.440
PM_{10}	1.90	4.4	0.90	0.040
$PM_{2.5}$	1.90	4.4	0.90	0.040
SO_2	0.10	0.2	0.10	0.002
VOC	3.90	7.7	1.00	0.060
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.00	1.8	1.00	0.010
NO_x	0.00	2.6	1.40	0.020
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.3	0.20	0.003
VOC	0.00	1.4	0.80	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.00	3.0	1.00	0.020
NO_x	0.00	4.7	1.40	0.030
PM_{10}	0.00	0.1	0.04	0.001
$PM_{2.5}$	0.00	0.1	0.04	0.001
SO_2	0.00	0.6	0.20	0.004
VOC	0.00	2.4	0.80	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.10	6.6	1.80	0.050
NO_x	4.40	13.4	3.50	0.110
PM_{10}	0.30	0.9	0.20	0.010
$PM_{2.5}$	0.20	0.7	0.20	0.010
SO_2	0.04	0.1	0.03	0.001
VOC	0.80	2.0	0.60	0.020

TABLE H-11
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-H

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	2.10	6.4	1.70	0.050
NO_x	4.40	13.1	3.30	0.100
PM_{10}	0.30	0.9	0.20	0.010
$PM_{2.5}$	0.20	0.7	0.20	0.010
SO_2	0.04	0.1	0.03	0.001
VOC	0.80	2.0	0.50	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-12
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-I

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Fugitive Dust from Earthmoving and Grading Activities				
PM_{10}	117.8	235.6	22.70	1.570
$PM_{2.5}$	11.8	23.6	2.30	0.160
Paved and Unpaved Road Dust – Conventional Steel Erection Option[1]				
PM_{10}	2,871.6	5,367.9	1,133.80	39.020
$PM_{2.5}$	289.0	540.1	114.10	3.930
Paved and Unpaved Road Dust – Steel Erection Using Helicopters Option[1]				
PM_{10}	2,963.2	5,173.3	1,052.00	38.250
$PM_{2.5}$	298.2	520.6	105.90	3.850
Nonroad Engine Emissions – Conventional Steel Erection Option[1]				
CO	59.1	128.6	17.40	0.850
NO_x	25.3	71.7	15.80	0.470
PM_{10}	2.3	5.7	1.00	0.040
$PM_{2.5}$	2.3	5.7	1.00	0.040
SO_2	0.1	0.3	0.10	0.002
VOC	4.6	9.8	1.20	0.060
Nonroad Engine Emissions – Steel Erection Using Helicopters Option[1]				
CO	58.8	120.6	17.40	0.820
NO_x	25.0	63.8	15.80	0.440
PM_{10}	2.3	5.2	1.00	0.040
$PM_{2.5}$	2.3	5.2	1.00	0.040
SO_2	0.1	0.3	0.10	0.002
VOC	4.6	9.2	1.20	0.060

TABLE H-12
CRITERIA POLLUTANT EMISSIONS FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-I

Pollutant	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Helicopter Emissions – Conventional Steel Erection Option[1]				
CO	0.0	2.1	1.20	0.010
NO_x	0.0	3.1	1.70	0.020
PM_{10}	0.0	0.1	0.05	0.001
$PM_{2.5}$	0.0	0.1	0.05	0.001
SO_2	0.0	0.4	0.20	0.003
VOC	0.0	1.7	1.00	0.010
Helicopter Emissions – Steel Erection Using Helicopters Option[1]				
CO	0.0	3.6	1.20	0.020
NO_x	0.0	5.6	1.70	0.030
PM_{10}	0.0	0.2	0.05	0.001
$PM_{2.5}$	0.0	0.2	0.05	0.001
SO_2	0.0	0.7	0.20	0.004
VOC	0.0	2.9	1.00	0.020
Traffic Emissions – Conventional Steel Erection Option[1]				
CO	2.5	7.9	2.10	0.050
NO_x	5.3	16.1	4.20	0.110
PM_{10}	0.4	1.1	0.30	0.010
$PM_{2.5}$	0.3	0.9	0.20	0.010
SO_2	0.1	0.1	0.03	0.001
VOC	0.9	2.4	0.70	0.020
Traffic Emissions – Steel Erection Using Helicopters Option[1]				
CO	2.5	7.7	2.00	0.050
NO_x	5.3	15.7	3.90	0.100
PM_{10}	0.4	1.1	0.30	0.010
$PM_{2.5}$	0.3	0.9	0.20	0.010
SO_2	0.1	0.1	0.03	0.001
VOC	0.9	2.4	0.60	0.020

NOTES:

[1] Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-13
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-B
(AGENCY AND APPLICANT PREFERRED ALTERNATIVE)

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,694.2	9,725.9	1,151.0	76.14
Helicopter	131.2	1,279.2	213.2	7.94
Traffic	2,215.6	4,119.4	637.1	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	4,478.7	7,619.8	872.1	63.43
Helicopter	816.1	1,389.7	213.2	11.83
Traffic	2,245.2	3,913.4	607.0	33.08

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-14
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-C

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,829.6	10,006.5	1,184.2	76.14
Helicopter	135.0	1,316.1	219.4	7.94
Traffic	2,279.5	4,238.2	655.5	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	4,608.0	7,839.6	897.2	63.43
Helicopter	839.6	1,429.8	219.4	11.83
Traffic	2,310.0	4,026.3	624.5	33.08

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-15
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-D

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,738.6	11,889.8	1,407.1	76.14
Helicopter	160.4	1,563.8	260.6	7.94
Traffic	2,708.6	5,035.9	778.9	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	5,475.2	9,315.1	1,066.1	63.43
Helicopter	997.6	1,698.9	260.6	11.83
Traffic	2,744.8	4,784.2	742.1	33.08

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-16
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE WYCO-F

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,024.7	10,410.7	1,232.0	76.14
Helicopter	140.4	1,369.3	228.2	7.94
Traffic	2,371.6	4,409.4	682.0	34.09
Steel Erection Using Helicopters Option				
Nonroad Engine	4,794.1	8,156.3	933.5	63.43
Helicopter	873.5	1,487.5	228.2	11.83
Traffic	2,403.3	4,189.0	649.8	33.08

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-17
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-B

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,689.7	16,754.2	3,571.7	93.18
Helicopter	0.0	1,451.1	808.7	8.09
Traffic	2,607.7	7,126.0	1,913.2	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	5,625.7	14,557.6	2,665.9	81.84
Helicopter	0.0	2,558.1	808.7	12.06
Traffic	2,607.7	6,985.3	1,815.4	40.86

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-18
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-C

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,903.6	17,384.3	3,706.0	93.18
Helicopter	0.0	1,505.7	839.1	8.09
Traffic	2,705.8	7,394.0	1,985.2	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	5,837.2	15,105.1	2,766.1	81.84
Helicopter	0.0	2,654.3	839.1	12.06
Traffic	2,705.8	7,248.0	1,883.7	40.86

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-19
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT BAX-E

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	5,940.3	17,492.4	3,729.1	93.18
Helicopter	0.0	1,515.1	844.3	8.09
Traffic	2,722.6	7,439.9	1,997.5	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	5,873.5	15,198.9	2,783.3	81.84
Helicopter	0.0	2,670.8	844.3	12.06
Traffic	2,722.6	7,293.1	1,895.4	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE H-20
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons/Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,198.0	12,361.7	2,635.3	93.18
Helicopter	0.0	1,070.7	596.6	8.09
Traffic	1,924.0	5,257.7	1,411.6	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,150.7	10,740.9	1,966.9	81.84
Helicopter	0.0	1,887.4	596.6	12.06
Traffic	1,924.0	5,153.9	1,339.5	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE H-21
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT)
FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-B

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,401.7	12,961.7	2,763.2	93.18
Helicopter	0.0	1,122.7	625.6	8.09
Traffic	2,017.4	5,512.9	1,480.1	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,352.2	11,262.3	2,062.4	81.84
Helicopter	0.0	1,979.0	625.6	12.06
Traffic	2,017.4	5,404.1	1,404.5	40.86
NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.				

TABLE H-22
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-C (AGENCY AND APPLICANT PREFERRED ALTERNATIVE)

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,275.4	12,589.7	2,683.9	93.18
Helicopter	0.0	1,090.4	607.7	8.09
Traffic	1,959.5	5,354.7	1,437.6	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,227.3	10,939.0	2,003.2	81.84
Helicopter	0.0	1,922.2	607.6	12.06
Traffic	1,959.5	5,249.0	1,364.2	40.86

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-23
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-H

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,087.9	12,037.6	2,566.2	93.18
Helicopter	0.0	1,042.6	581.0	8.09
Traffic	1,873.6	5,119.9	1,374.6	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,041.9	10,459.4	1,915.4	81.84
Helicopter	0.0	1,838.0	581.0	12.06
Traffic	1,873.6	5,018.8	1,304.3	40.86

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-24
GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALENT) FOR TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-I

Area of Emissions	Year 1 (tons)	Year 2 (tons)	Year 3 (tons)	Tons Per Mile of Transmission Line
Conventional Steel Erection Option				
Nonroad Engine	4,894.9	14,413.9	3,072.8	93.18
Helicopter	0.0	1,248.4	695.7	8.09
Traffic	2,243.5	6,130.6	1,646.0	41.72
Steel Erection Using Helicopters Option				
Nonroad Engine	4,839.8	12,524.1	2,293.5	81.84
Helicopter	0.0	2,200.8	695.7	12.06
Traffic	2,243.5	6,009.6	1,561.8	40.86

NOTE: Emissions would occur from construction activities including either steel erection using helicopters or conventional steel erection, not both. Emissions above include all activities, not just steel erection.

TABLE H-25 CRITERIA POLLUTANT EMISSIONS FOR SERIES COMPENSATION STATIONS (EACH SERIES COMPENSATION STATION)			
Pollutant	**Year 1 (tons)**	**Year 2 (tons)**	**Year 3 (tons)**
Fugitive Dust from Earthmoving and Grading Activities			
PM_{10}	1.900	4.000	0.0000
$PM_{2.5}$	0.200	0.400	0.0000
Paved and Unpaved Road Dust			
PM_{10}	1.400	4.300	3.4000
$PM_{2.5}$	0.100	0.400	0.4000
Nonroad Engine Emissions			
CO	5.600	9.900	6.6000
NO_x	5.000	5.400	6.3000
PM_{10}	0.300	0.40	0.4000
$PM_{2.5}$	0.300	0.40	0.4000
SO_2	0.010	0.010	0.0100
VOC	0.400	0.900	0.5000
Traffic Emissions			
CO	0.030	0.040	0.0300
NO_x	0.070	0.090	0.0600
PM_{10}	0.010	0.010	0.0040
$PM_{2.5}$	0.004	0.010	0.0030
SO_2	0.001	0.001	0.0004
VOC	0.010	0.020	0.0100

NOTES:
CO = Carbon monoxide
NO_x = Nitrogen oxides
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

TABLE H-26 GREENHOUSE GAS EMISSIONS (CARBON DIOXIDE EQUIVALNT) FOR SERIES COMPENSATION STATIONS (EACH SERIES COMPENSATION STATION)			
Area of Emissions	**Year 1 (tons)**	**Year 2 (tons)**	**Year 3 (tons)**
Nonroad Engine	948.8	887.7	1,179.0
Traffic	35.4	53.6	24.5

H.2 Modeling Results Summary Tables – Transmission Line and Series Compensation Station Construction

TABLE H-27
MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVES WYCO-B (AGENCY AND APPLICANT PREFERRED ALTERNATIVE), WYCO-C, WYCO-D, AND WYCO-F

Pollutant	Averaging Period	Maximum AERSCREEN Concentration (μg/m^3)	Background Concentration (μg/m^3)	Project Impact plus Background (μg/m^3)	Limiting Standard (μg/m^3)	Comments
NO_2	1-hour	1,307.2	55.7	1,362.9	188.7	May exceed the numerical value of the standards
PM_{10}	24-hour	62.5	58.4	120.9	150.0	Below all ambient air quality standards
$PM_{2.5}$	24-hour	8.2	13.2	21.4	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	1,379.3	7,137.3	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,092.0	6,850.0	10,000.0	Below all ambient air quality standards
SO_2	1-hour	3.2	13.2	16.3	196.4	Below all ambient air quality standards
	3-hour	3.2	10.3	13.4	700.0	Below all ambient air quality standards

NOTES:
A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011, memorandum: *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard*
CO = Carbon monoxide
NO_2 = Nitrogen dioxide
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide

TABLE H-28
MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVES COUT BAX-B, COUT BAX-C, AND COUT BAX-E

Pollutant	Averaging Period	Maximum AERSCREEN Concentration (μg/m^3)	Background Concentration (μg/m^3)	Project Impact plus Background (μg/m^3)	Limiting Standard (μg/m^3)	Comments
NO_2	1-hour	1,307.2	73.7	1,380.9	188.7	May exceed the numerical value of the standards
PM_{10}	24-hour	62.5	78.8	141.4	150.0	Below all ambient air quality standards
$PM_{2.5}$	24-hour	8.2	19.9	28.1	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	1,954.0	7,712.0	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,264.4	7,022.4	10,000.0	Below all ambient air quality standards

TABLE H-28
MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVES COUT BAX-B, COUT BAX-C, AND COUT BAX-E

Pollutant	Averaging Period	Maximum AERSCREEN Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Project Impact plus Background ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Comments
SO_2	1-hour	3.2	7.9	11.1	196.4	Below all ambient air quality standards
	3-hour	3.2	7.9	11.1	700.0	Below all ambient air quality standards

NOTES:
A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011, memorandum: *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard*
CO = Carbon monoxide
NO_2 = Nitrogen dioxide
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide

TABLE H-29
MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A AND ALTERNATIVE COUT-B (EXCEPT UTAH COUNTY PM_{10})

Pollutant	Averaging Period	Maximum AERSCREEN Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Project Impact plus Background ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Comments
NO_2	1-hour	1,307.2	93.0	1,400.2	188.7	May exceed the numerical value of the standards
PM_{10}	24-hour	62.5	78.8	141.4	150.0	Below all ambient air quality standards
$PM_{2.5}$	24-hour	8.2	19.8	28.0	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	4,367.8	10,125.8	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,724.1	7,482.1	10,000.0	Below all ambient air quality standards
SO_2	1-hour	3.2	7.9	11.1	196.4	Below all ambient air quality standards
	3-hour	3.2	7.9	11.1	700.0	Below all ambient air quality standards

NOTES:
A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011, memorandum: *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard*
CO = Carbon monoxide
NO_2 = Nitrogen dioxide
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide

TABLE H-30
MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVE COUT-A (UTAH COUNTY), ALTERNATIVE COUT-B (UTAH COUNTY), AND ALTERNATIVE COUT-C (AGENCY AND APPLICANT PREFERRED ALTERNATIVE) (UTAH COUNTY)

Pollutant	**Averaging Period**	**Maximum AERSCREEN Concentration $(\mu g/m^3)$**	**Background Concentration $(\mu g/m^3)$**	**Project Impact plus Background $(\mu g/m^3)$**	**Limiting Standard $(\mu g/m^3)$**	**Comments**
PM_{10}	24-hour	62.5	49.5	112.0	150.0	Below all ambient air quality standards

NOTE: PM_{10} = Particulate matter less than 10 micrometers

TABLE H-31
MODELING RESULTS – TRANSMISSION LINE CONSTRUCTION FOR ALTERNATIVES COUT-C (AGENCY AND APPLICANT PREFERRED ALTERNATIVE), ALTERNATIVES COUT-H, AND COUT-I (EXCEPT UTAH COUNTY PM_{10})

Pollutant	**Averaging Period**	**Maximum AERSCREEN Concentration $(\mu g/m^3)$**	**Background Concentration $(\mu g/m^3)$**	**Project Impact plus Background $(\mu g/m^3)$**	**Limiting Standard $(\mu g/m^3)$**	**Comments**
NO_2	1-hour	1,307.2	67.0	1,374.2	188.7	May exceed the numerical value of the standards
PM_{10}	24-hour	62.5	78.8	141.4	150.0	Below all ambient air quality standards
$PM_{2.5}$	24-hour	8.2	14.5	22.7	35.0	Below all ambient air quality standards
CO	1-hour	5,758.0	4,367.8	10,125.8	40,000.0	Below all ambient air quality standards
	8-hour	5,758.0	1,724.1	7,482.1	10,000.0	Below all ambient air quality standards
SO_2	1-hour	3.2	7.9	11.1	196.4	Below all ambient air quality standards
	3-hour	3.2	7.9	11.1	700.0	Below all ambient air quality standards

NOTES:

A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency's March 1, 2011 memorandum: *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard*

CO = Carbon monoxide
NO_2 = Nitrogen dioxide
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide

TABLE H-32
MODELING RESULTS – SERIES COMPENSATION STATION CONSTRUCTION (EACH SERIES COMPENSATION STATION)

Pollutant	Averaging Period	Maximum AERSCREEN Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Project Impact plus Background ($\mu g/m^3$)	Limiting Standard ($\mu g/m^3$)	Comments
NO_2	1-hour	4,950.4	67.0	5,017.4	188.7	May exceed the numerical value of the standards
PM_{10}	24-hour	20.5	78.8	99.3	150.0	Below all ambient air quality standards
$PM_{2.5}$	24-hour	7.1	14.5	21.6	35.0	Below all ambient air quality standards
CO	1-hour	4,524.0	4,367.8	8,891.8	40,000.0	Below all ambient air quality standards
	8-hour	4,524.0	1,724.1	6,248.1	10,000.0	Below all ambient air quality standards
SO_2	1-hour	11.4	7.9	19.3	196.4	Below all ambient air quality standards
	3-hour	11.4	7.9	19.3	700.0 (Colorado) 1,300 (Utah)	Below all ambient air quality standards

NOTES:
A factor of 80 percent was applied to estimated nitrogen oxides concentrations for conversion to nitrogen dioxide based on the Environmental Protection Agency’s March 1, 2011, memorandum: *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour* NO_2 *National Ambient Air Quality Standard*
CO = Carbon monoxide
NO_2 = Nitrogen dioxide
$PM_{2.5}$ = Particulate matter less than 2.5 micrometers
PM_{10} = Particulate matter less than 10 micrometers
SO_2 = Sulfur dioxide

Appendix I
Water Resources Supporting Data

APPENDIX I – WATER RESOURCES SUPPORTING DATA

I.1 Introduction

Information presented in this appendix was compiled to provide supplemental water resource information for Chapters 3 and 4.

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TABLE I-1
DIRECT AND INDIRECT CROSSINGS OF IMPAIRED WATERS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Direct Crossings	Indirect Crossings	Cause of Impairment	Source of Impairment	Designated/Beneficial Use
Wyoming								
W110	Great Divide Closed Basin, Muddy	WYCO-D	5/2	Muddy Creek-1	Muddy Creek-1	Habitat alterations	Grazing nonpoint source	▪ Agriculture ▪ Aquatic life other than fish ▪ Cold water fishery ▪ Fish consumption ▪ Industry ▪ Recreation ▪ Scenic value ▪ Wildlife
W121	Muddy	WYCO-D	2/2	Muddy Creek-2	Muddy Creek-2	Selenium, chloride	Nonpoint source, natural	▪ Agriculture ▪ Aquatic life other than fish ▪ Fish consumption ▪ Industry ▪ Recreation ▪ Scenic value ▪ Wildlife
Colorado								
C13	Little Snake, Upper Yampa	WYCO-D	1/0	Fortification Creek		Selenium	Unknown	▪ Agriculture ▪ Aquatic Life Warm Water-Class 1 ▪ Recreation Primary Contact
C185	Lower White	All COUT BAX	1/0	West Evacuation Creek and Douglas Creek		Sedimentation/silt	Unknown	▪ Agriculture ▪ Aquatic Life Warm Water-Class 2 ▪ Recreation Primary Contact

TABLE I-1
DIRECT AND INDIRECT CROSSINGS OF IMPAIRED WATERS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Direct Crossings	Indirect Crossings	Cause of Impairment	Source of Impairment	Designated/Beneficial Use
C186	Lower White	All COUT	10/5	West Evacuation Creek and Douglas Creek	West Evacuation Creek and Douglas Creek	Sedimentation/silt	Unknown	▪ Agriculture ▪ Aquatic life warm water-class 2 ▪ Recreation primary contact
C187	Lower Green-Diamond, Lower White	COUT-A, COUT-B , COUT-C (Colorado-Utah Border Variation 1)	5/1	West Evacuation Creek and Douglas Creek	West Evacuation Creek and Douglas Creek	Sedimentation/silt	Unknown	▪ Agriculture ▪ Aquatic life warm water-class 2 ▪ Recreation primary contact
C188	Lower White	COUT-C (Colorado-Utah Border Agency Preferred), COUT-H, COUT-I	10/5	West Evacuation Creek and Douglas Creek	West Evacuation Creek and Douglas Creek	Sedimentation/silt	Unknown	▪ Agriculture ▪ Aquatic life warm water-class 2 ▪ Recreation primary contact
C195	Lower White	All COUT BAX	19/12	Evacuation Creek, West Evacuation Creek and Douglas Creek	Evacuation Creek, West Evacuation Creek and Douglas Creek	Sedimentation/silt	Unknown	▪ Agriculture ▪ Aquatic life warm water-class 2 ▪ Recreation primary contact
C196	Colorado Headwaters-Plateau, Lower White	All COUT BAX	81/16	Evacuation Creek	Evacuation Creek	Total dissolved solids	Nonpoint source, agriculture	▪ Agricultural ▪ Secondary recreation ▪ Warm water aquatic life
C91	Little Snake, Lower Yampa	WYCO-B, WYCO-C, WYCO-F	1/0	Yampa River		Iron	Unknown	▪ Agriculture ▪ Aquatic life warm
Utah								
U300	Lower White, Willow	COUT-C, COUT-H, COUT-I	8/2	Willow Creek	Willow Creek	Unknown	Nonpoint source, unknown	▪ Agricultural ▪ Aquatic life support ▪ Cold water game fish ▪ Secondary recreation

TABLE I-1
DIRECT AND INDIRECT CROSSINGS OF IMPAIRED WATERS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Direct Crossings	Indirect Crossings	Cause of Impairment	Source of Impairment	Designated/Beneficial Use
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	6/1	Willow Creek	Willow Creek	Unknown	Nonpoint source, unknown	▪ Agricultural ▪ Aquatic life support ▪ Cold water game fish ▪ Secondary recreation
U410	Duchesne	COUT-A, COUT-B	40/6	Dry Gulch Creek, Uinta River-2	Dry Gulch Creek	Physical substrate habitat alterations; total dissolved solids	Nonpoint sources, agriculture, habitat alterations, natural/wildlife	▪ Agricultural ▪ Aquatic life support ▪ Secondary recreation ▪ Warm water game fish
U420	Duchesne, Strawberry	COUT-A	76/35	Dry Gulch Creek, Lake Fork-1	Dry Gulch Creek	Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U421	Strawberry	COUT-A	13/4	Lake Fork-1	Lake Fork-1	Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U424	Strawberry	COUT-A	13/4	Lake Fork-1	Lake Fork-1	Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U425	Strawberry	COUT-A	1/0	Lake Fork-1		Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U426	Strawberry	COUT-A	12/3	Lake Fork-1	Lake Fork-1	Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation

TABLE I-1
DIRECT AND INDIRECT CROSSINGS OF IMPAIRED WATERS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Direct Crossings	Indirect Crossings	Cause of Impairment	Source of Impairment	Designated/Beneficial Use
U427	Strawberry	COUT-A	3/4	Lake Fork-1	Lake Fork-1	Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U428	Spanish Fork, Strawberry	COUT-I (Chipman Creek Variation 1)	1/1	Lake Fork-1	Lake Fork-1	Total dissolved solids	Nonpoint source	Agricultural Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U429	Spanish Fork, Strawberry	COUT-A (Chipman Creek COUT-A)	2/0	Lake Fork-1		Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U430	Duchesne	COUT-B	51/17	Dry Gulch Creek, Duchesne River-3, Lake Fork-1	Dry Gulch Creek, Lake Fork-1	Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	61/29	Lake Fork-1	Lake Fork-1	Total dissolved solids	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Secondary recreation
U433	Spanish Fork	COUT-A	1/0	Soldier Creek-1		Phosphorus, sedimentation/ siltation, total suspended solids	Nonpoint source	▪ Infrequent primary contact recreation ▪ Cold water fishery/aquatic life ▪ Agricultural uses
U490	Westwater Canyon	COUT BAX-B, COUT BAX-C, COUT BAX-E	21/3	Cottonwood Wash, Westwater Creek	Westwater Creek	Unknown	Nonpoint source	▪ Agricultural ▪ Cold water aquatic life ▪ Domestic water supply ▪ Primary recreation ▪ Warm water aquatic life

TABLE I-1
DIRECT AND INDIRECT CROSSINGS OF IMPAIRED WATERS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Direct Crossings	Indirect Crossings	Cause of Impairment	Source of Impairment	Designated/Beneficial Use
U498	San Rafael	COUT-I	11/4	Huntington Creek-1	Huntington Creek-1	Selenium	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses
U535	Spanish Fork	COUT-C (U.S. Highway 6 Variation 1)	2/1	Soldier Creek-1	Soldier Creek-1	Phosphorus, sedimentation/ siltation, total suspended solids	Nonpoint source	▪ Infrequent primary contact recreation ▪ Cold water fishery/aquatic life ▪ Agricultural uses
U537	Price	COUT BAX-E	7/0	Gordon Creek and Tributaries		Total dissolved solids	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses
U539	Spanish Fork	COUT-B, COUT-C	1/0	Soldier Creek-1		Phosphorus, sedimentation/ siltation, total suspended solids	Nonpoint source	▪ Infrequent primary contact recreation ▪ Cold water fishery/aquatic life ▪ Agricultural uses
U548	Price	COUT-H	8/2	Gordon Creek and Tributaries	Gordon Creek and Tributaries	Total dissolved solids	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses
U587	Price, San Rafael	COUT-I	12/2	Huntington Creek-1	Huntington Creek-1	Salinity/total dissolved solids/chlorides	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses

TABLE I-1
DIRECT AND INDIRECT CROSSINGS OF IMPAIRED WATERS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Direct Crossings	Indirect Crossings	Cause of Impairment	Source of Impairment	Designated/Beneficial Use
U600	Price, San Pitch, San Rafael	COUT BAX-E, COUT-H	8/6	Gordon Creek and Tributaries, Huntington Creek-1	Gordon Creek and Tributaries, Huntington Creek-1	Total dissolved solids	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses
U625	Spanish Fork, Utah Lake	COUT-A, COUT-B, COUT-C	1/0	Thistle Creek-1		Unknown	Unknown	▪ Infrequent primary contact recreation ▪ Cold water fishery/aquatic life ▪ Agricultural uses
U628	San Rafael	COUT BAX-B, COUT BAX-C	7/0	Huntington Creek-1		Selenium	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses
U629	San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	16/3	Huntington Creek-1	Huntington Creek-1	Selenium	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses
U630	San Pitch, San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	6/1	Huntington Creek-1	Huntington Creek-1	Selenium	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses
U731	San Rafael	COUT BAX-B, COUT BAX-C	3/0	Huntington Creek-1		Selenium	Point/nonpoint source	▪ Infrequent primary contact recreation ▪ Nongame fishery/aquatic life ▪ Agricultural uses

TABLE I-1
DIRECT AND INDIRECT CROSSINGS OF IMPAIRED WATERS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Direct Crossings	Indirect Crossings	Cause of Impairment	Source of Impairment	Designated/Beneficial Use
U732	San Rafael	COUT BAX-B, COUT BAX-C	3/1	Huntington Creek-1	Huntington Creek-1	Selenium	Point/nonpoint source	■ Infrequent primary contact recreation ■ Nongame fishery/aquatic life ■ Agricultural uses
U765	San Rafael	COUT BAX-B, COUT BAX-C	13/3	Huntington Creek-1	Huntington Creek-1	Selenium	Point/nonpoint source	■ Infrequent primary contact recreation ■ Nongame fishery/aquatic life ■ Agricultural uses

TABLE I-2
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE FORESTED WETLAND(S) BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
Utah					
U390	Lower Green-Diamond	COUT-A, COUT-B	1/0	Palustrine, forested, temporary flooded	

TABLE I-3 DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE EMERGENT WETLANDS BY LINK					
Link	**Name of Hydrologic Subbasin**	**Alternative Route (Variation)**	**Direct/Indirect Crossings**	**Wetland Class Directly Crossed**	**Wetland Class Indirectly Crossed**
Wyoming					
W21	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-B, WYCO-C, WYCO-F	0/2		Palustrine, emergent, seasonally flooded (PEMC); Palustrine, Unconsolidated Shore, Seasonally Flooded, Excavated (PUSCx)
W22	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-D	0/9		Palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, temporary flooded, Diked/impounded (PEMAh); palustrine, emergent, saturated (PEMB); palustrine, emergent, seasonally flooded (PEMC); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
W30	Upper North Platte	All WYCO	1/1	Palustrine, emergent, seasonally flooded (PEMC)	Palustrine, emergent, seasonally flooded (PEMC)
W32	Great Divide Closed Basin, Upper North Platte	All WYCO	1/1	Palustrine, emergent, temporary flooded (PEMA)	Palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
W101	Great Divide Closed Basin	WYCO-B, WYCO-C, WYCO-F	0/1		Palustrine, emergent, seasonally flooded (PEMC)
W102	Great Divide Closed Basin, Muddy	WYCO-C	2/0	Palustrine, emergent, temporary flooded (PEMA); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)	
W108	Great Divide Closed Basin, Muddy	WYCO-B, WYCO-F	0/1		Palustrine, emergent, temporary flooded (PEMA)
W110	Great Divide Closed Basin, Muddy	WYCO-D	0/2		palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)

TABLE I-3
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE EMERGENT WETLANDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
W111	Muddy	WYCO-D	0/1		Palustrine, unconsolidated shore, seasonally flooded, diked/impounded(PUSCh)
W116	Muddy	WYCO-B	1/0	Palustrine, emergent, temporary flooded. (PEMA)	
W120	Muddy	WYCO-F	0/1		Palustrine, emergent, seasonally flooded (PEMC)
W125	Great Divide Closed Basin	WYCO-B, WYCO-F	0/2		Palustrine, unconsolidated shore, temporary flooded, excavated (PUSAx); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
Colorado					
C93	Lower Yampa	WYCO-B (Deerlodge Road Variation 1)	1/3	Palustrine, emergent, seasonally flooded (PEMC)	Ppalustrine, emergent, seasonally flooded (PEMC); palustrine, emergent, seasonally flooded, diked/impounded (PEMCh)
C95	Lower Yampa	WYCO-B (Deerlodge Road Variation 2)	1/0	Palustrine, emergent, seasonally flooded (PEMC)	
C106	Lower Yampa	WYCO-D	0/2		Palustrine, emergent, seasonally flooded (PEMC); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
C171	Lower Yampa	All WYCO	0/1		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
C173	Lower Yampa	All WYCO	0/2		Palustrine, emergent, seasonally flooded, diked/impounded (PEMCh)
C175	Lower White, Lower Yampa	All WYCO	0/2		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)

TABLE I-3
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE EMERGENT WETLANDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
C177	Lower White	All COUT BAX	3/5	Palustrine, emergent, seasonally flooded, diked/impounded (PEMCh)	Palustrine, emergent, temporary flooded, dike/impounded (PEMAh); palustrine, emergent, seasonally flooded (PEMC); palustrine, emergent, seasonally flooded, diked/impounded (PEMCh); palustrine, emergent, semipermanently flooded (PEMF); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
C195	Lower White	All COUT BAX	2/1	Palustrine, emergent, seasonally flooded, diked/impounded (PEMCh); Palustrine, Unconsolidated Shore, Seasonally Flooded, Diked/impounded (PUSCh)	Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
C196	Colorado Headwaters-Plateau, Lower White	All COUT BAX	0/3		Palustrine, emergent, temporary flooded, dike/impounded (PEMAh); palustrine, emergent, seasonally flooded, diked/impounded (PEMCh)
C197	Colorado Headwaters-Plateau	All COUT BAX	1/1	Palustrine, emergent, seasonally flooded, diked/impounded (PEMCh)	Palustrine, emergent, seasonally flooded (PEMC)
Utah					
U241	Lower Green-Diamond, Lower White	COUT-A, COUT-B, COUT-C (Colorado Utah Border Variation 1)	2/0	Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)	
U242	Lower White	COUT-C (Colorado-Utah Border Agency Preferred), COUT-H, COUT-I	0/2		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
U260	Lower White	COUT-C (Colorado-Utah Border Variation 1)	0/1		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)

TABLE I-3
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE EMERGENT WETLANDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
U300	Lower White, Willow	COUT-C, COUT-H, COUT-I	0/1		Palustrine, unconsolidated shore, temporary flooded, excavated (PUSAx)
U391	Duchesne, Lower Green-Diamond	COUT-A, COUT-B	2/0	Palustrine, emergent, temporary flooded (PEMA)	
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	0/2		Palustrine, unconsolidated shore, temporary flooded, excavated (PUSAx); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
U406	Lower Green-Desolation Canyon, Price	COUT-H, COUT-I	0/1		Palustrine, emergent, saturated (PEMB)
U407	Lower Green-Desolation Canyon	COUT-H, COUT-I (Argyle Ridge Variation 1)	2/0	Palustrine, emergent, saturated (PEMB); palustrine, emergent, seasonally flooded (PEMC)	
U410	Duchesne	COUT-A, COUT-B	10/12	Palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, seasonally flooded, excavated (PEMCx); palustrine, emergent, semipermanently Flooded (PEMF)	Palustrine, aquatic bed, artifically flooded, excavated (PABKx); palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, seasonally flooded (PEMC); palustrine, emergent, semipermanently flooded (PEMF); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh); Palustrine, Unconsolidated Shore, Seasonally Flooded, Excavated (PUSCx)
U413	Lower Green-Desolation Canyon	COUT-C	1/1	Palustrine, emergent, temporary flooded (PEMA)	Palustrine, emergent, temporary flooded (PEMA)
U417	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 2, and 3)	1/1	Palustrine, emergent, saturated (PEMB)	

TABLE I-3
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE EMERGENT WETLANDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
U420	Duchesne, Strawberry	COUT-A	25/10	Palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, saturated (PEMB); palustrine, emergent, seasonally flooded (PEMC); palustrine, emergent, semipermanently flooded (PEMF)	Palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, saturated (PEMB); palustrine, emergent, seasonally flooded (PEMC); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
U421	Strawberry	COUT-A	0/4		Palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
U425	Strawberry	COUT-A	0/1		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
U426	Strawberry	COUT-A	1/1	Palustrine, emergent, temporary flooded (PEMA)	Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
U427	Strawberry	COUT-A	0/4		Palustrine, emergent, saturated (PEMB); palustrine, emergent, saturated, beaver (PEMBb); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh); palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
U430	Duchesne	COUT-B	19/7	Palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, saturated (PEMB); palustrine, emergent, seasonally flooded (PEMC); palustrine, emergent, semipermanently flooded (PEMF)	Palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, seasonally flooded (PEMC); palustrine, emergent, semipermanently flooded (PEMF)

TABLE I-3 DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE EMERGENT WETLANDS BY LINK					
Link	**Name of Hydrologic Subbasin**	**Alternative Route (Variation)**	**Direct/Indirect Crossings**	**Wetland Class Directly Crossed**	**Wetland Class Indirectly Crossed**
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	7/7	Palustrine, emergent, temporary flooded (PEMA)	Palustrine, emergent, temporary flooded (PEMA); palustrine, emergent, saturated (PEMB); palustrine, emergent, seasonally flooded (PEMC); palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh); palustrine, unconsolidated shore, temporary flooded, excavated (PUSAx)
U489	Price	COUT BAX-E	0/3		Palustrine, emergent, seasonally flooded, diked/impounded (PEMCh); palustrine, unconsolidated shore, temporary flooded, excavated (PUSAx)
U490	Westwater Canyon	All COUT BAX	0/1		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
U492	Price	COUT-I	0/1		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
U523	Price	COUT-I	0/1		Palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
U524	Price	COUT-B	0/1		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
U544	Price	COUT BAX-E	0/1		Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)
U545	Price	COUT-H	0/1		Palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)
U548	Price	COUT-H	1/0	Palustrine, unconsolidated shore, temporary flooded, diked/impounded (PUSAh)	

TABLE I-3
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE EMERGENT WETLANDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
U242R	Lower White	Bear's Ears to Bonanza 345-kilovolt (kV) link	0/1		Palustrine, unconsolidated shore, seasonally flooded, diked/impounded (PUSCh)

TABLE I-4
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE SCRUB AND SHRUB WETLAND BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct / Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
Wyoming					
W32	Great Divide Closed Basin, Upper North Platte	All WYCO	0/1		Palustrine, scrub-shrub, temporary flooded (PSSA)
Colorado					
C177	Lower White	All COUT BAX	2/1	Palustrine, scrub-shrub, temporary flooded, diked/impounded (PSSAh)	Palustrine, scrub-shrub, temporary flooded, diked/impounded (PSSAh)
Utah					
U242	Lower White	COUT-C (Colorado-Utah Agency Preferred), COUT-H, COUT-I	0/1		Palustrine, scrub-shrub, temporary flooded, diked/impounded (PSSAh)
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	0/1		Palustrine, scrub-shrub, temporary flooded (PSSA)
U410	Duchesne	COUT-A, COUT-B	2/3	Palustrine, scrub-shrub, temporary flooded (PSSA)	Palustrine, scrub-shrub, temporary flooded (PSSA)
U413	Lower Green-Desolation Canyon	COUT-C	0/1		Palustrine, scrub-shrub, temporary flooded (PSSA)
U420	Duchesne, Strawberry	COUT-A	5/1	Palustrine, scrub-shrub, temporary flooded (PSSA)	Palustrine, scrub-shrub, temporary flooded (PSSA)
U426	Strawberry	COUT-A	0/1		Palustrine, scrub-shrub, temporary flooded (PSSA)
U430	Duchesne	COUT-B	11/1	Palustrine, scrub-shrub, temporary flooded (PSSA); palustrine, scrub-shrub, saturated (PSSB)	Palustrine, scrub-shrub, temporary flooded (PSSA)

TABLE I-4
DIRECT AND INDIRECT CROSSINGS OF PALUSTRINE SCRUB AND SHRUB WETLAND BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct / Indirect Crossings	Wetland Class Directly Crossed	Wetland Class Indirectly Crossed
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	4/0	Palustrine, scrub-shrub, temporary flooded (PSSA)	
U432	Lower Green-Desolation Canyon	COUT-B	0/2		Palustrine, scrub-shrub, temporary flooded (PSSA); Palustrine, scrub-shrub, saturated, beaver (PSSBb)
U495	Price	COUT BAX-E	1/0	Palustrine, scrub-shrub, temporary flooded (PSSA)	
U515	Price, Strawberry	(Camp Timberlane/Argyle Canyon Variations 2 and 5)	0/1		Palustrine, scrub-shrub, temporary flooded (PSSA)
U527	Price	COUT-B	1/2	Palustrine, scrub-shrub, temporary flooded (PSSA)	Palustrine, scrub-shrub, temporary flooded (PSSA)

TABLE I-5
DIRECT AND INDIRECT CROSSINGS OF RIPARIAN AREAS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings
Wyoming			
W16	Medicine Bow	WYCO-D	1/2
W21	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-B, WYCO-C, WYCO-F	4/10
W22	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-D	9/9
W27	Little Snake, Muddy	WYCO-C	4/6
W30	Upper North Platte	All WYCO	16/10
W32	Great Divide Closed Basin, Upper North Platte	All WYCO	4/5
W36	Upper North Platte	All WYCO	0/1
W102	Great Divide Closed Basin, Muddy	WYCO-C	2/3
W108	Great Divide Closed Basin, Muddy	WYCO-B, WYCO-F	9/7
W109	Great Divide Closed Basin	WYCO-D	1/1
W110	Great Divide Closed Basin, Muddy	WYCO-D	12/9
W111	Muddy	WYCO-D	12/12
W113	Little Snake, Muddy	WYCO-B	5/9
W120	Muddy	WYCO-F	7/9
W121	Muddy	WYCO-D	1/5
W124	Little Snake, Muddy	WYCO-F	3/2

TABLE I-5
DIRECT AND INDIRECT CROSSINGS OF RIPARIAN AREAS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/Indirect Crossings
W125	Great Divide Closed Basin	WYCO-B, WYCO-F	2/2
W128	Muddy	WYCO-C	4/4
W302	Little Snake	WYCO-B, WYCO-F	3/2
W409	Little Snake	WYCO-C	4/3
W410	Little Snake	WYCO-C	1/1
W411	Little Snake	WYCO-B, WYCO-C, WYCO-F	1/2
Colorado			
C13	Little Snake, Upper Yampa	WYCO-D	3/2
C27	Little Snake	WYCO-D	1/1
C71	Little Snake	WYCO-B, WYCO-C, WYCO-F	2/1
C72	Little Snake	WYCO-B (Little Snake Variation 1)	0/1
C91	Little Snake, Lower Yampa	WYCO-B, WYCO-C, WYCO-F	1/0
C100	Upper Yampa	WYCO-D	6/6
C101	Upper Yampa	WYCO-D	0/1
C105	Lower Yampa, Upper Yampa	WYCO-D	2/2
C177	Lower White	All COUT BAX	1/1
C196	Colorado Headwaters-Plateau, Lower White	All COUT BAX	0/3
C197	Colorado Headwaters-Plateau	All COUT BAX	1/5
Utah			
U300	Lower White, Willow	COUT-C, COUT-H, COUT-I	1/1
U390	Lower Green-Diamond	COUT-A, COUT-B	1/2
U391	Duchesne, Lower Green-Diamond	COUT-A, COUT-B	1/0
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	2/1
U407	Lower Green-Desolation Canyon	COUT-H, COUT-I (Argyle Ridge Variation 1)	0/1
U410	Duchesne	COUT-A, COUT-B	11/7
U420	Duchesne, Strawberry	COUT-A	9/7
U424	Strawberry	COUT-A	29/20
U426	Strawberry	COUT-A	7/2
U427	Strawberry	COUT-A	10/4
U428	Spanish Fork, Strawberry	COUT-A (Chipman Creek Variation 1)	9/7
U429	Spanish Fork, Strawberry	COUT-A	5/1
U430	Duchesne	COUT-B	14/11
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	4/2
U433	Spanish Fork	COUT-A	7/3

TABLE I-5 DIRECT AND INDIRECT CROSSINGS OF RIPARIAN AREAS BY LINK			
Link	**Name of Hydrologic Subbasin**	**Alternative Route (Variation)**	**Direct/Indirect Crossings**
U435	Price	COUT-H	3/2
U460	Spanish Fork	COUT-A, COUT-B, COUT-C	1/0
U486	Lower Green, Upper Colorado-Kane Springs, Westwater Canyon	All COUT BAX	0/1
U487	Lower Green	All COUT BAX	1/2
U488	Lower Green, Price	COUT BAX-C, COUT BAX-E	1/0
U489	Price	COUT BAX-E	2/3
U490	Westwater Canyon	All COUT BAX	2/2
U493	Price	COUT BAX-E, COUT-I	0/2
U494	Price	COUT-I	3/2
U495	Price	COUT BAX-E	4/2
U498	San Rafael	COUT-I	2/0
U515	Price, Strawberry	COUT-C (Camp Timberlane/Argyle Canyon Variations 2 and 5)	0/3
U523	Price	COUT-I	0/2
U527	Price	COUT-B	1/2
U535	Spanish Fork	COUT-C (U.S. Highway 6 Variation 1)	5/1
U537	Price	COUT BAX-E	2/2
U539	Spanish Fork	COUT-B, COUT-C	1/0
U545	Price	COUT-H	0/2
U548	Price	COUT-H	1/0
U621	Spanish Fork	COUT-A, COUT-B, COUT-C	2/2
U625	Spanish Fork, Utah Lake	COUT-A, COUT-B, COUT-C	14/10
U630	San Pitch, San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	0/1
U631	San Pitch, Utah Lake	COUT BAX-B, COUT BAX-C, COUT-I	2/1
U636	San Pitch, Utah Lake	COUT BAX-E, COUT-H	0/1
U637	Utah Lake	All COUT BAX, COUT-H, COUT-I	0/1
U639	Utah Lake	All COUT BAX and COUT	3/2
U650	Utah Lake	All COUT BAX and COUT	4/2
U730	Lower Green, San Rafael	COUT BAX-B	0/2
U731	San Rafael	COUT BAX-B, COUT BAX-C	2/0
U765	San Rafael	COUT BAX-B, COUT BAX-C	7/2

TABLE I-6
DIRECT AND INDIRECT CROSSINGS OF LAKES, RESERVOIRS, AND PONDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
Wyoming					
W21	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-B, WYCO-C, WYCO-F	0/2		Unknown
W22	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-D	1/5	Unknown	Unknown, Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)
W30	Upper North Platte	All WYCO	2/1	Unknown; Lacustrine, Littoral, Unconsolidated Shore, Temporary Flooded (L2USA)	Unknown
W32	Great Divide Closed Basin, Upper North Platte	All WYCO	0/1		Unknown
W101	Great Divide Closed Basin	WYCO-B, WYCO-C, WYCO-F	0/2	Unknown	Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); unknown
W102	Great Divide Closed Basin, Muddy	WYCO-C	1/0	Lacustrine, littoral, unconsolidated shore, temporary flooed (L2USA)	
W108	Great Divide Closed Basin, Muddy	WYCO-B, WYCO-F	1/0	Unknown	
W110	Great Divide Closed Basin, Muddy	WYCO-D	0/4		Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); unknown
W111	Muddy	WYCO-D	1/4	Unknown	Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); unknown
W116	Muddy	WYCO-B	0/2		Duck Lake, unknown
W120	Muddy	WYCO-F	0/1		Unknown
W125	Great Divide Closed Basin	WYCO-B, WYCO-F	0/1		Unknown

TABLE I-6
DIRECT AND INDIRECT CROSSINGS OF LAKES, RESERVOIRS, AND PONDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
Colorado					
C13	Little Snake, Upper Yampa	WYCO-D	1/1	Unknown	Unknown
C27	Little Snake	WYCO-D	1/0	Unknown	
C91	Little Snake, Lower Yampa	WYCO-B, WYCO-C, WYCO-F	0/1		Unknown
C93	Lower Yampa	WYCO-B (Deerlodge Road Variation 1)	0/3		Unknown
C100	Upper Yampa	WYCO-D	2/7	Unknown	Basin Reservoir, unknown
C101	Upper Yampa	WYCO-D	0/3		Unknown
C105	Lower Yampa, Upper Yampa	WYCO-D	0/1		Unknown
C106	Lower Yampa	WYCO-D	2/0	Culverwell Reservoir, unknown	
C177	Lower White	All COUT BAX	2/3	Lacustrine, limnetic, unconsolidated bottom, permanently flooded, diked/impounded (L1UBHh)	Box Elder Reservoir, palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); Villard Flats Reservoir
C186	Lower White	All COUT	0/2		Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)
C195	Lower White	All COUT BAX	1/2	Unknown	Unknown
C196	Colorado Headwaters-Plateau, Lower White	All COUT BAX	0/1		Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)
C197	Colorado Headwaters-Plateau	All COUT BAX	0/6		Unknown
Utah					
U241	Lower Green-Diamond, Lower White	COUT-A, COUT-B, COUT-C(Colorado-Utah Border Variation 1)	1/1	Unknown	Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)
U242	Lower White	COUT-C (Colorado-Utah Border Agency preferred), COUT-H, COUT-I	2/0	Unknown, palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)	
U260	Lower White	COUT-C (Colorado-Utah Border Variation 1)	0/1		Unknown
U300	Lower White, Willow	COUT-C, COUT-H, COUT-I	1/1	Unknown	Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)

TABLE I-6
DIRECT AND INDIRECT CROSSINGS OF LAKES, RESERVOIRS, AND PONDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U390	Lower Green-Diamond	COUT-A, COUT-B	0/1		Lacstrine, Littoral, Unconsolidated Shore, Seasonally Flooded (L2USC)
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	0/4		Unknown
U406	Lower Green-Desolation Canyon, Price	COUT-H, COUT-I	0/2		Palustinre, aquatic bed, semipermanently flooded (PABF); Sky-high Pond
U407	Lower Green-Desolation Canyon	COUT-H, COUT-I(Argyle Ridge Variation 1)	0/1		Unknown
U410	Duchesne	COUT-A, COUT-B	1	Unknown	Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); Unknown
U411	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 1 and 2)	0/2		Unknown
U420	Duchesne, Strawberry	COUT-A	4/6	Unknown, palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)	Palustrine, Aquatic Bed, Semipermanently Flooded (PABF); palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); Unknown
U421	Strawberry	COUT-A	0/4		Unknown
U425	Strawberry	COUT-A	0/1		Unknown
U426	Strawberry	COUT-A	1/1	Palustrine, aquatic bed, semipermanently flooded (PABF)	Unknown
U427	Strawberry	COUT-A	0/4		Palustrine, Aquatic Bed, Intermittently explosed, beaver (PABGb); Unknown
U429	Spanish Fork, Strawberry	COUT-A (Chipman Creek)	0/2		Unknown
U430	Duchesne	COUT-B	1/1	Unknown	Unknown

TABLE I-6
DIRECT AND INDIRECT CROSSINGS OF LAKES, RESERVOIRS, AND PONDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	0/5		Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); Unknown
U432	Lower Green-Desolation Canyon	COUT-B	0/2		Palustrine, aquatic bed, imtermittently exposed, beaver (PABGb); Unknown
U486	Lower Green, Upper Colorado-Kane Springs, Westwater Canyon	All COUT BAX	0/2		Unknown
U489	Price	COUT BAX-E	0/2		Unknown
U490	Westwater Canyon	All COUT BAX	0/2		Unknown
U492	Price	COUT-I	0/1		Unknown
U515	Price, Strawberry	COUT-C (Camp Timberlane/Argyle Variations 2 and 5)	0/5		Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh); palustrine, aquatic bed, imtermittently exposed, beaver (PABGb); Unknown
U516	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 3, and 4)	0/1		Palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)
U523	Price	COUT-I	0/2		Unknown
U524	Price	COUT-B	0/1		Unknown
U527	Price	COUT-B	0/2		Unknown
U530	Price, Spanish Fork	COUT-B, COUT-C	0/1		Unknown
U537	Price	COUT BAX-E	0/1		Unknown
U544	Price	COUT BAX-E	1/0	Unknown	
U600	Price, San Pitch, San Rafael	COUT BAX-E, COUT-H	0/1		Unknown
U621	Spanish Fork	COUT-A, COUT-B, COUT-C	0/1		Unknown
U628	San Rafael	COUT BAX-B, COUT BAX-C	0/1		Unknown
U630	San Pitch, San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	0/1		Unknown
U631	San Pitch, Utah Lake	COUT BAX-B, COUT BAX-C, COUT-I	0/2		Unknown

TABLE I-6
DIRECT AND INDIRECT CROSSINGS OF LAKES, RESERVOIRS, AND PONDS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U636	San Pitch, Utah Lake	COUT BAX-E, COUT-H	0/4		Unknown
U638	Utah Lake	COUT-A, COUT-B, COUT-C	0/1		Unknown
U650	Utah Lake	All COUT BAX and COUT	0/1		Unknown
U729	Lower Green, San Rafael	COUT BAX-B	0/1		Unknown
U765	San Rafael	COUT BAX-B, COUT BAX-C	0/3		Unknown
U242R	Lower White	Bears Ears to Bonanza 345kV link	2/0	Unknown, palustrine, aquatic bed, semipermanently flooded, diked/impounded (PABFh)	

TABLE I-7
DIRECT AND INDIRECT CROSSINGS OF PERENNIAL STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
Wyoming					
W16	Medicine Bow	WYCO-D	1/0	Unknown	
W21	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-B, WYCO-C, WYCO-F	1/0	Unknown	
W30	Upper North Platte	All WYCO	1/0	Unknown	
W110	Great Divide Closed Basin, Muddy	WYCO-D	5/0	Muddy Creek	
W111	Muddy	WYCO-D	5/2	Muddy Creek	Muddy Creek
W121	Muddy	WYCO-D	2/3	Muddy Creek	Muddy Creek
Colorado					
C13	Little Snake, Upper Yampa	WYCO-D	2/1	Little Cottonwood Creek, Fortification Creek	Fortification Creek
C27	Little Snake	WYCO-D	1/0	Unknown	
C71	Little Snake	WYCO-B, WYCO-C, WYCO-F	1/0	Unknown	
C72	Little Snake	WYCO-B (Little Snake Variation 1)	1/0	Unknown	
C91	Little Snake, Lower Yampa	WYCO-B, WYCO-C, WYCO-F	1/0	Unknown	
C100	Upper Yampa	WYCO-D	9/1	Little Bear Creek, Elkhead Creek, unknown	Little Bear Creek

TABLE I-7
DIRECT AND INDIRECT CROSSINGS OF PERENNIAL STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
C105	Lower Yampa, Upper Yampa	WYCO-D	1/0	Unknown	
C106	Lower Yampa	WYCO-D	1/0	Unknown	
C177	Lower White	All COUT BAX	2/1	Unknown	Unknown
C185	Lower White	All COUT BAX	1/0	Douglas Creek	
C186	Lower White	All COUT	1/1	Stinking Water Creek	Stinking Water Creek
C196	Colorado Headwaters-Plateau, Lower White	All COUT BAX	38/2	Whiskey Creek	Whiskey Creek
Utah					
U260	Lower White	COUT-C (Colorado-Utah Border Variation 1)	1/0	Unknown	
U300	Lower White, Willow	COUT-C, COUT-H, COUT-I	2/0	Willow Creek, unknown	
U390	Lower Green-Diamond	COUT-A, COUT-B	2/0	Unknown	
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	2/0	Unknown	
U406	Lower Green-Desolation Canyon, Price	COUT-H, COUT-I	1/2	Minnie Maud Creek	Minnie Maud Creek
U407	Lower Green-Desolation Canyon	COUT-H, COUT-I (Argyle Ridge Variation 1)	1/2	Argyle Creek	Argyle Creek
U410	Duchesne	COUT-A, COUT-B	5/0	Unknown, Dry Gulch Creek, Montes Creek, Uinta River	
U411	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 1 and 2)	2/1	Unknown	Unknown
U413	Lower Green-Desolation Canyon	COUT-C	1/0	Argyle Creek	
U414	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variation 3)	2/1	Unknown	Unknown
U417	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 2, and 3)	3/1	Minnie Maud Creek	Minnie Maud Creek
U420	Duchesne, Strawberry	COUT-A	5/10	Unknown, Lake Fork River	Lake Fork River, unknown
U424	Strawberry	COUT-A	1/1	Strawberry River	Strawberry River
U426	Strawberry	COUT-A	2/0	Red Creek, Currant Creek	
U428	Spanish Fork, Strawberry	COUT-A (Chipman Creek Variation 1)	0/1		Unknown
U430	Duchesne	COUT-B	2/2	Lake Fork River, unknown	Lateral Number 5, unknown

TABLE I-7
DIRECT AND INDIRECT CROSSINGS OF PERENNIAL STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	29/29	Sowers Creek, unknown	Sowers Creek, Unknown
U432	Lower Green-Desolation Canyon	COUT-B	5/9	Argyle Creek	Argyle Creek
U433	Spanish Fork	COUT-A	7/3	Tie Fork, Sheep Creek, Soldier Creek	Sheep Creek
U435	Price	COUT-H	3/9	Summit Creek, unknown	Willow Creek
U438	Price	COUT-B	2/0	Unknown	
U460	Spanish Fork	COUT-A, COUT-B, COUT-C	1/0	Lake Fork	
U486	Lower Green, Upper Colorado-Kane Springs, Westwater Canyon	All COUT BAX	2/0	Thompson Wash, unknown	
U487	Lower Green	All COUT BAX	2/0	Unknown	
U489	Price	COUT BAX-E	1/0	Unknown	
U492	Price	COUT-I	2/2	Coal Creek, Soldier Creek	Coal Creek, Soldier Creek
U494	Price	COUT-I	3/1	Miller Creek, unknown	Miller Creek
U495	Price	COUT BAX-E	3/1	Unknown	Unknown
U498	San Rafael	COUT-I	1/1	Huntington Creek	Huntington Creek
U504	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 3)	1/0	Unknown	
U514	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 2, 3, and 4)	4/7	West Fork Willow Creek, Willow Creek	West Fork Willow Creek, Willow Creek, unknown
U515	Price, Strawberry	COUT-C (Camp Timberlane/Argyle Canyon Variations 2 and 5)	12/1	Tabbyune Creek, Bear Creek	Tabbyune Creek
U516	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 3, and 4)	4/1	Tabbyune Creek, Right Fork Kyune Creek, Kyune Creek, Horse Creek	Kyune Creek
U520	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 4)	0/1		Unknown
U523	Price	COUT-I	14/2	Summit Creek, Coal Creek	Coal Creek, Summit Creek
U524	Price	COUT-B	6/0	Horse Creek, unknown, Willow Creek	
U527	Price	COUT-B	3/6	Price River, Beaver Creek	Kyune Creek, Price River

TABLE I-7
DIRECT AND INDIRECT CROSSINGS OF PERENNIAL STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
U530	Price, Spanish Fork	COUT-B, COUT-C	3/0	Tie Fork, Indian Creek, Soldier Creek	
U535	Spanish Fork	COUT-C (U.S Highway 6 Variation 1)	2/2	Soldier Creek	Soldier Creek
U537	Price	COUT BAX-E	3/0	Unknown	
U539	Spanish Fork	COUT-B, COUT-C	2/1	Soldier Creek, Sheep Creek	Soldier Creek
U545	Price	COUT-H	1/2	Price River	Price River
U548	Price	COUT-H	1/1	North Fork Gordon Creek	North Fork Gordon Creek
U560	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 1, Camp Timberlane/Argyle Canyon Variations 2, 3, 4, and 5)	1/1	White River	
U585	Price	COUT BAX-E	1/3	Miller Creek	Miller Creek
U587	Price, San Rafael	COUT-I	1/0	Cedar Creek	
U600	Price, San Pitch, San Rafael	COUT BAX-E, COUT-H	7/3	Gooseberry Creek, Unknown, Mud Creek, Upper Huntington Creek, White Pine Fork, Cottonwood Creek	Cottonwood Creek, Gooseberry Creek, Mud Creek
U621	Spanish Fork	COUT-A, COUT-B, COUT-C	1/0	Unknown	
U625	Spanish Fork, Utah Lake	COUT-A, COUT-B, COUT-C	3/0	Thistle Creek, unknown	
U629	San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	1/2	Deer Creek	Deer Creek
U630	San Pitch, San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	3/0	Indian Creek, Pleasant Creek, Coal Fork	
U631	San Pitch, Utah Lake	COUT BAX-B, COUT BAX-C, COUT-I	2/0	San Pitch River, unknown	
U636	San Pitch, Utah Lake	COUT BAX-E, COUT-H	2/5	San Pitch River, unknown	Unknown
U637	Utah Lake	All COUT BAX, COUT-H, COUT-I	1/0	Hop Creek	
U638	Utah Lake	COUT-A, COUT-B, COUT-C	1/1	Hop Creek	Hop Creek
U639	Utah Lake	All COUT BAX and COUT	1/1	Unknown	Unknown
U650	Utah Lake	All COUT BAX and COUT	1/3	Unknown	Currant Creek, unknown
U731	San Rafael	COUT BAX-B, COUT BAX-C	1/0	Huntington Creek	

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
Wyoming					
W15	Medicine Bow	All WYCO	3/1	Sledge Creek, unknown	Unknown
W16	Medicine Bow	WYCO-D	9/3	Unknown	Unknown
W21	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-B, WYCO-C, WYCO-F	38/13	Big Ditch, Middle Ditch, Saint Marys Creek, unknown	Unknown
W22	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-D	42/9/	Big Ditch, Jim Creek, Saint Marys Creek, unknown	Jim Creek, Saint Marys Creek, unknown
W27	Little Snake, Muddy	WYCO-C	53/20	Unknown	Unknown
W30	Upper North Platte	All WYCO	36/9	Coal Creek, Sugar Creek, unknown	Unknown
W32	Great Divide Closed Basin, Upper North Platte	All WYCO	29/13	Fillmore Creek, Separation Creek, unknown	Separation Creek, unknown
W35	Upper North Platte	All WYCO	13/1	Unknown	Unknown
W36	Upper North Platte	All WYCO	1/0	Unknown	
W101	Great Divide Closed Basin	WYCO-B, WYCO-C, WYCO-F	17/6	Unknown	Unknown
W102	Great Divide Closed Basin, Muddy	WYCO-C	5/2	Unknown	Unknown
W107	Muddy	WYCO-F	16/0	Unknown	
W108	Great Divide Closed Basin, Muddy	WYCO-B, WYCO-F	25/4	Unknown	Unknown
W109	Great Divide Closed Basin	WYCO-D	5/3	Unknown	Unknown
W110	Great Divide Closed Basin, Muddy	WYCO-D	39/8	Antelope Creek, Unknown	Antelope Creek, Unknown
W111	Muddy	WYCO-D	18/3	Unknown	Unknown
W113	Little Snake, Muddy	WYCO-B	34/25	Sand Creek, unknown; riverine, intermittent, seasonally flooded (R4USC)	Sand Creek, unknown
W116	Muddy	WYCO-B	11/2	Red Wash, unknown	Unknown
W120	Muddy	WYCO-F	23/5	Cottonwood Creek, North Fork Cottonwood Creek, Red Wash, unknown	North Fork Cottonwood Creek, unknown

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
W121	Muddy	WYCO-D	5/2	Cottonwood Creek, unknown	Cottonwood Creek, unknown
W124	Little Snake, Muddy	WYCO-F	37/7	Sand Creek; unknown; riverine, intermittent, temporary flooded (R4USA); riverine, intermittent, seasonally flooded (R4USC)	Sand Creek; Red Creek; unknown; riverine, intermittent, temporary flooded (R4USA)
W125	Great Divide Closed Basin	WYCO-B, WYCO-F	6/2	Unknown	Unknown
W128	Muddy	WYCO-C	14/0	Unknown	
W300	Little Snake, Muddy	WYCO-D	3/0	Unknown	
W302	Little Snake	WYCO-B, WYCO-F	10/4	East Fork Cherokee Creek, unknown	East Fork Cherokee Creek, unknown
W321	Little Snake	WYCO-D	5/0	Unknown	
W409	Little Snake	WYCO-C	35/13	East Fork Cherokee Creek; Sand Creek; West Branch Willow Creek; unknown; riverine, intermittent, temporary flooded (R4USA); riverine, intermittent, seasonally flooded (R4USC)	Riverine, intermittent, temporary flooded (R4USA); unknown; West Branch Willow Creek
W410	Little Snake	WYCO-C	6/2	Unknown	Unknown
W411	Little Snake	WYCO-B, WYCO-C, WYCO-F	4/6	West Fork Cherokee Creek, unknown	West Fork Cherokee Creek, unknown
Colorado					
C13	Little Snake, Upper Yampa	WYCO-D	34/16	Unknown	Unknown
C20	Little Snake	WYCO-D	12/4	Timberlake Creek, unknown	Unknown
C25	Little Snake	WYCO-D	3/0	Unknown	
C27	Little Snake	WYCO-D	2/1	Unknown	Unknown
C31	Little Snake	WYCO-B, WYCO-C, WYCO-F	19/5	Powder Wash, unknown	Powder Wash, unknown
C33	Little Snake	WYCO-D	1/2	Unknown	Unknown
C61	Little Snake	WYCO-B, WYCO-C, WYCO-F	51	Unknown	Unknown
C71	Little Snake	WYCO-B, WYCO-C, WYCO-F	2/1	Unknown	Unknown
C72	Little Snake	WYCO-B (Little Snake Variation 1)	4/0	Unknown	
C91	Little Snake, Lower Yampa	WYCO-B, WYCO-C, WYCO-F	14/4	Unknown	Unknown

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
C92	Lower Yampa	WYCO-B, WYCO-C, WYCO-F	1/0	Unknown	
C93	Lower Yampa	WYCO-B (Deerlodge Road Variation 1)	8/7	Unknown	Unknown
C94	Lower Yampa	WYCO-B (Deerlodge Road Variation 1 and 2)	4/0	Unknown	
C95	Lower Yampa	WYCO-B (Deerlodge Road Variation 2)	9/3	Unknown	Unknown
C100	Upper Yampa	WYCO-D	28/11	Dry Cottonwood Creek, Elkhorn Ditch, unknown	Unknown, Elkhorn Ditch
C101	Upper Yampa	WYCO-D	15/7	Unknown	Unknown
C105	Lower Yampa, Upper Yampa	WYCO-D	8/4	Bogenschutz Creek, unknown	Unknown
C106	Lower Yampa	WYCO-D	43/19	Deception Creek, unknown	Unknown
C170	Lower Yampa	WYCO-D	6/1	Unknown	Unknown
C171	Lower Yampa	All WYCO	1/0	Unknown	
C173	Lower Yampa	All WYCO	7/1	Unknown	Unknown
C175	Lower White, Lower Yampa	All WYCO	34/9	East Fork Wolf Creek, Middle Fork Wolf Creek, Unknown, Wolf Creek	Unknown
C177	Lower White	All COUT BAX	22/5	Red Wash, unknown	Unknown
C185	Lower White	All COUT BAX	10/1	Unknown	
C186	Lower White	COUT-A, COUT-B, COUT-C, COUT-H, COUT-I	47/17	Box Elder Creek, Miller Creek, Red Wash, Skull Creek, unknown, Willow Creek	Willow Creek, unknown
C187	Lower Green-Diamond, Lower White	COUT-A, COUT-B, COUT-C(Colorado-Utah Border Variation 1)	5/0	Dripping Rock Creek, East Twin Wash, unknown, West Twin Wash	
C188	Lower White	COUT-C (Colorado-Utah Border Agency Preferred), COUT-H, COUT-I	10/4	Dripping Rock Creek, East Twin Wash, unknown, West Twin Wash	East Twin Wash, Twin Wash, unknown
C195	Lower White	All COUT BAX	17/13	Unknown	Unknown
C196	Colorado Headwaters-Plateau, Lower White	All COUT BAX	43/21	Evacuation Creek, Missouri Creek, Texas Creek, unknown, Whiskey Creek	Missouri Creek; Evacuation Creek; unknown; Little Whiskey Creek; riverine, intermittent, streambed, temporary flooded (R4SBA)

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
C197	Colorado Headwaters-Plateau	All COUT BAX	144/61	West Salt Creek, unknown	West Salt Creek, unknown
C270	Colorado Headwaters-Plateau, Westwater Canyon	All COUT BAX	4/1	McDonald Creek, unknown	Unknown
Utah					
U241	Lower Green-Diamond, Lower White	COUT-A, COUT-B, COUT-C (Colorado-Utah Border Variation 1)	19/3	Unknown	Unknown
U242	Lower White	COUT-C (Colorado-Utah Border Agency Preferred), COUT-H, COUT-I	18/7	Unknown	Unknown
U260	Lower White	COUT-C (Colorado-Utah Border Variation 1)	6/2	Unknown	Unknown
U280	Lower White	COUT-C (Colorado-Utah Border Agency Preferred), COUT-H, COUT-I	9/0	Unknown; riverine, intermittent, streambed, temporary flooded (R4SBA)	
U285	Lower White	COUT-C (Colorado-Utah Border Agency Preferred), COUT-H, COUT-I	2/0	Unknown	
U290	Lower White	COUT-C (Colorado-Utah Border Variation 1)	3/1	Unknown	Unknown
U300	Lower White, Willow	COUT-C, COUT-H, COUT-I	38/12	Unknown; riverine, intermittent, streambed, seasonally flooded (R4SBC)	Unknown; riverine, intermittent, streambed, seasonally flooded (R4SBC)
U310	Lower Green-Diamond, Lower White	COUT-A, COUT-B	13/2	Unknown	Unknown
U390	Lower Green-Diamond	COUT-A, COUT-B	20/2	Unknown	Unknown
U391	Duchesne, Lower Green-Diamond	COUT-A, COUT-B	4/1	Unknown	Unknown
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	41/15	Unknown	Unknown
U401	Duchesne, Lower Green-Desolation Canyon	COUT-C, COUT-H, COUT-I	15/3	Unknown	Unknown
U404	Lower Green-Desolation Canyon	COUT-C, COUT-H, COUT-I	5/0	Unknown	

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U406	Lower Green-Desolation Canyon, Price	COUT-H, COUT-I	7/4	Dry Fork; unknown; riverine, intermittent, streambed, temporary flooded (R4SBA)	Unknown; riverine, intermittent, streambed, temporary flooded (R4SBA)
U407	Lower Green-Desolation Canyon	COUT-H, COUT-I (Argyle Ridge Variation 1)	8/3	Unknown; riverine, intermittent, streambed, temporary flooded (R4SBA)	Unknown; riverine, intermittent, streambed, temporary flooded (R4SBA)
U408	Lower Green-Desolation Canyon	COUT-C, COUT-C (Camp Timberlane/Argyle Canyon Variations 1 and 2), COUT-H, COUT-I	1/0	Unknown	
U409	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 3, 4, and 5)	0/2		Unknown
U410	Duchesne	COUT-A, COUT-B	38/12	North Lateral C Canal, unknown	Unknown
U411	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 1 and 2)	6/5	Unknown	Unknown
U413	Lower Green-Desolation Canyon	COUT-C (Argyle Ridge Agency Preferred)	0/4		Riverine, intermittent, streambed, temporary flooded (R4SBA); Unknown
U414	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variation 3)	5/1	Unknown	Unknown
U415	Lower Green-Desolation Canyon, Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1 and 2)	1/0	Unknown	
U417	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 2, and 3)	4/1	Unknown	Unknown
U419	Lower Green-Desolation Canyon	COUT-C (Camp Timberlane/Argyle Canyon Variations 4 and 5)	6/1	Unknown	Unknown
U420	Duchesne, Strawberry	COUT-A	42/25	Unknown	Unknown
U421	Strawberry	COUT-A	13/6	Unknown	Unknown
U424	Strawberry	COUT-A	12/4	Unknown	Unknown
U425	Strawberry	COUT-A	1/0	Unknown	
U426	Strawberry	COUT-A	9/1	Unknown	Unknown
U427	Strawberry	COUT-A	3/2	Unknown	Unknown
U428	Spanish Fork, Strawberry	COUT-A (Chipman Creek Variation 1)	1/1	Unknown	Unknown
U429	Spanish Fork, Strawberry	COUT-A	2/0	Unknown	

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U430	Duchesne	COUT-B	25/12	Lateral Number 5, Midview Ditch, Moon Lake Canal, unknown	Midview Ditch, unknown
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	33/24	Sowers Creek, Unknown	Riverine, intermittent, streambed, temporary flooded (R4SBA); Sowers Creek; unknown
U432	Lower Green-Desolation Canyon	COUT-B	10/3	Unknown	Unknown
U433	Spanish Fork	COUT-A	14/2	Sheep Creek, Unknown	Unknown
U434	Lower Green-Desolation Canyon, Price	COUT-B	2/0	Unknown	
U435	Price	COUT-H	8/1	Riverine, intermittent, streambed, temporary flooded (R4SBA)	Riverine, intermittent, streambed, temporary flooded (R4SBA)
U438	Price	COUT-B	1/0	Unknown	
U439	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 2)	2/0	Dry Fork, unknown	
U441	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1 and 2)	3/1	Unknown	Unknown
U443	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 1)	2/0	Dry Fork, unknown	
U445	Lower Green-Desolation Canyon, Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 3)	4/5	Dry Fork, unknown	Unknown
U460	Spanish Fork	COUT-A, COUT-B, COUT-C	6/0	Unknown	
U486	Lower Green, Upper Colorado-Kane Springs, Westwater Canyon	All COUT BAX	23/2	Unknown	Unknown
U487	Lower Green	All COUT BAX	30/6	Unknown	Unknown
U488	Lower Green, Price	COUT BAX-C, COUT BAX-E	19/5	Unknown	Unknown
U489	Price	COUT BAX-E	40/16	Horse Creek, Icelander Creek, unknown	Unknown
U490	Westwater Canyon	All COUT BAX	54/14	Bitter Creek, Westwater Creek, unknown	Unknown

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U492	Price	COUT-I	27/12	Unknown	Riverine, intermittent, streambed, temporary flooded (R4SBA); Unknown
U493	Price	COUT BAX-E, COUT-I	5/1	Unknown	Unknown
U494	Price	COUT-I	16/4	Unknown	Unknown
U495	Price	COUT BAX-E	22/2	Unknown	Riverine, intermittent, streambed, temporary flooded (R4SBA); unknown
U496	Price	COUT BAX-E, COUT-I	6/1	Unknown	Unknown
U498	San Rafael	COUT-I	10/1	Unknown	Unknown
U502	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 1)	1/0	Unknown	
U504	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 3)	1/0	Unknown	
U508	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1 and 3)	2/0	Unknown	
U512	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 2)	3/0	Unknown	
U513	Price, Strawberry	COUT-C (Camp Timberlane/Argyle Canyon Variation 5)	5/1	Willow Creek, unknown	Unknown
U514	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 2, 3, and 4)	3/1	Unknown	Unknown
U515	Price, Strawberry	COUT-C (Camp Timberlane/Argyle Canyon Variation 2, Camp Timberlane/Argyle Canyon Variation 5)	8/8	Unknown	Bear Creek, Unknown
U516	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1, 3, and 4)	2/2	Unknown	Unknown
U520	Price	COUT-C (Camp Timberlane/Argyle Canyon Variation 4)	6/5	Unknown	Unknown
U523	Price	COUT-I	15/4	Clearwater Creek, Hoffman Creek, unknown	Riverine, intermittent, streambed, temporary flooded (R4SBA); unknown
U524	Price	COUT-B	20/1	Unknown	Unknown
U527	Price	COUT-B	19/6	Unknown	Unknown

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U530	Price, Spanish Fork	COUT-B, COUT-C	7/1	Soldier Creek, unknown	Unknown
U533	Spanish Fork	COUT-B, COUT-C	7/2	Unknown	Unknown
U535	Spanish Fork	COUT-C (U.S. Highway 6 Variation 1)	5/0	Unknown	
U537	Price	COUT BAX-E	14/3/	Serviceberry Creek, unknown	Unknown
U539	Spanish Fork	COUT-B, COUT-C	4/1	Unknown	Unknown
U544	Price	COUT BAX-E	6/1	Unknown	Unknown
U545	Price	COUT-H	3/0	Unknown	
U546	Price	COUT-H	7/3	Unknown	Unknown
U548	Price	COUT-H	14/3	Unknown	Unknown
U560	Price	COUT-C (Camp Timberlane/Argyle Canyon Variations 1 through 5)	1/1	Unknown	Unknown
U585	Price	COUT BAX-E	8/5	Unknown	Unknown
U586	Price	COUT-I	9/3	Unknown	Unknown
U587	Price, San Rafael	COUT-I	13/1	Unknown	Cedar Creek, unknown
U600	Price, San Pitch, San Rafael	COUT BAX-E, COUT-H	12/6	Maple Fork, Unknown	Unknown
U621	Spanish Fork	COUT-A, COUT-B, COUT-C	8/0	Unknown	Unknown
U625	Spanish Fork, Utah Lake	COUT-A, COUT-B, COUT-C	18/0	Unknown	
U628	San Rafael	COUT BAX-B, COUT BAX-C	7/0	Unknown	
U629	San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	14/3	Cottonwood Creek, Whetstone Creek, unknown	Unknown
U630	San Pitch, San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	9/1	Little North Creek, North Creek, unknown	Unknown
U631	San Pitch, Utah Lake	COUT BAX-B, COUT BAX-C, COUT-I	59/41	Unknown	Unknown
U636	San Pitch, Utah Lake	COUT BAX-E, COUT-H	41/16	Unknown	Unknown
U637	Utah Lake	All COUT BAX, COUT-H, COUT-I	3/2	Unknown	Unknown
U638	Utah Lake	COUT-A, COUT-B, COUT-C	13/2	Unknown	Unknown
U639	Utah Lake	All COUT BAX and COUT	7/2	Unknown	Unknown
U640	Utah Lake	345kV link	7/0	Unknown	
U642	Utah Lake	345kV link	7/0	Unknown	
U643	Utah Lake	345kV link	2/0	Unknown	
U650	Utah Lake	All COUT BAX and COUT	11/4	Salt Creek, Unknown	Unknown
U728	San Rafael	COUT BAX-B	1/0	Unknown	
U729	Lower Green, San Rafael	COUT BAX-B	15/1	Unknown	Unknown

TABLE I-8
DIRECT AND INDIRECT CROSSINGS OF INTERMITTENT STREAMS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U730	Lower Green, San Rafael	COUT BAX-B	33/1	Unknown; riverine, intermittent, streambed, intermittently flooded (R4SBJ)	Unknown
U731	San Rafael	COUT BAX-B, COUT BAX-C	1/0	Unknown	
U732	San Rafael	COUT BAX-B, COUT BAX-C	18/4	Unknown	Unknown
U733	Lower Green, San Rafael	COUT BAX-C	10/1	Unknown	Unknown
U734	Lower Green, Price	COUT BAX-C	25/5	Unknown	Unknown
U765	San Rafael	COUT BAX-B, COUT BAX-C	9/0	Unknown	
U242R	Lower White	Bears Ears to Bonanza 345kV link	3/2	Unknown	Unknown

TABLE I-9
DIRECT AND INDIRECT CROSSINGS OF CANAL DITCH BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
Wyoming					
W22	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-D	1/3	Palustrine, unconsolidated shore, temporary flooded (PUSA)	Palustrine, unconsolidated shore, temporary flood (PUSA)
W30	Upper North Platte	WYCO-B, WYCO-C, WYCO-D, WYCO-F	0/3		Palustrine, unconsolidated shore, temporary flood (PUSA)
W32	Great Divide Closed Basin, Upper North Platte	WYCO-B, WYCO-C, WYCO-D, WYCO-F	0/1		Palustrine, unconsolidated shore, temporary flood (PUSA)
W108	Great Divide Closed Basin, Muddy	WYCO-B, WYCO-F	1/1	Palustrine, unconsolidated shore, temporary flood (PUSA)	Palustrine, unconsolidated shore, temporary flood (PUSA)
W116	Muddy	WYCO-B	2/1	Palustrine, unconsolidated shore, seasonally flooded (PUSC)	Palustrine, unconsolidated shore, seasonally flood (PUCA)

TABLE I-9
DIRECT AND INDIRECT CROSSINGS OF CANAL DITCH BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
W120	Muddy	WYCO-F	0/1		Palustrine, unconsolidated bottom, semipermanently flooded, excavated (PUBFx)
Colorado					
C20	Little Snake	WYCO-D	1/1	Unknown	Unknown
C25	Little Snake	WYCO-D	1/1	West Side Canal	West Side Canal
C27	Little Snake	WYCO-D	2/1	Gibson Blair Ditch, Trowel Ditch	West Side Canal
C33	Little Snake	WYCO-D	0/3		West Side Canal
C100	Upper Yampa	WYCO-D	2/0	Little Bear Ditch, Smith Ditch	
C106	Lower Yampa	WYCO-D	1/0	Maybell Ditch	
Utah					
U300	Lower White, Willow	COUT-C, COUT-H, COUT-I	0/1		Palustrine, unconsolidated bottom, semipermanently flooded, excavated (PUBFx)
U391	Duchesne, Lower Green-Diamond	COUT-A, COUT-B	1/0	Unknown	
U400	Lower Green-Desolation Canyon, Willow	COUT-C, COUT-H, COUT-I	0/1		Palustrine, unconsolidated shore, temporary flood (PUSA)
U410	Duchesne	COUT-A, COUT-B	1/0	Unknown	
U420	Duchesne, Strawberry	COUT-A	2/1	Unknown, Knight Ditch	Unknown
U426	Strawberry	COUT-A	1/1	Unknown	Palustrine, unconsolidated bottom, semipermanently flooded, excavated (PUBFx)
U430	Duchesne	COUT-B	6/4	Unknown, Gray Mountain Canal	Unknown; palustrine, unconsolidated bottom, semipermanently flood, excavated (PUBFx)
U488	Lower Green, Price	All COUT Bax	1/1	Unknown	Palustrine, unconsolidated bottom, semipermanently flood, excavated (PUBFx)

TABLE I-9
DIRECT AND INDIRECT CROSSINGS OF CANAL DITCH BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route (Variation)	Direct/ Indirect Crossings	Name(s) or Class of Water Directly Crossed	Name(s) or Class of Water Indirectly Crossed
U489	Price	COUT BAX-E	0/1		Palustrine, unconsolidated bottom, semipermanently flood, excavated (PUBFx)
U492	Price	COUT-I	2/0	Wellington Canal	
U493	Price	COUT BAX-E, COUT-I	2/0	Unknown, Carbon Canal	
U494	Price	COUT-I	3/0	Unknown	
U495	Price	COUT BAX-E	0/1		Unknown
U498	San Rafael	COUT-I	3/0	Unknown	
U630	San Pitch, San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	0/1		North Fork Coal Fork
U631	San Pitch, Utah Lake	COUT BAX-B, COUT BAX-C, COUT-I	1/0	Unknown	
U636	San Pitch, Utah Lake	COUT BAX-E, COUT-H	6/0	Unknown	
U731	San Rafael	COUT BAX-B, COUT BAX-C	1/0	Unknown	
U734	Lower Green, Price	COUT BAX-C	0/1		Palustrine, unconsolidated bottom, semipermanently flood, excavated (PUBFx)
U765	San Rafael	COUT BAX-B, COUT BAX-C	3/1	Cottonwood Creek Huntington Canal, Mammoth Canal, Unknown	Unknown

TABLE I-10
DIRECT AND INDIRECT CROSSINGS OF WELLS AND SPRINGS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route	Direct/ Indirect Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
Wyoming					
W113	Little Snake, Muddy	WYCO-B	1/0	Unknown	
Colorado					
C13	Little Snake, Upper Yampa	WYCO-D	4/3	Unknown	Unknown
Utah					
U430	Duchesne	COUT-B	2/0	Unknown	
U431	Duchesne, Lower Green-Desolation Canyon	COUT-B	2/0	Unknown	
U433	Spanish Fork	COUT-A	1/0	Unknown	

TABLE I-10
DIRECT AND INDIRECT CROSSINGS OF WELLS AND SPRINGS BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route	Direct/ Indirect Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
U489	Price	COUT BAX-E	1/0	Unknown	
U527	Price	COUT-B	2/0	Unknown	
U530	Price, Spanish Fork	COUT-B, COUT-C	1/0	Unknown	
U539	Spanish Fork	COUT-B, COUT-C	1/0	Unknown	
U600	Price, San Pitch, San Rafael	COUT BAX-E, COUT-H	1/0	Unknown	
U629	San Rafael	COUT BAX-B, COUT BAX-C, COUT-I	2/0	Unknown	
U730	Lower Green, San Rafael	COUT BAX-B	1/0	Unknown	

TABLE I-11
DIRECT AND INDIRECT CROSSINGS OF EPHEMERAL STREAM WASH BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route	Number of Direct Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
Wyoming					
W124	Little Snake, Muddy	WYCO-F	3/0	Unknown	
W409	Little Snake	WYCO-C	2/2	Unknown	Unknown

TABLE I-12
DIRECT AND INDIRECT CROSSINGS OF SWAMP MARSH ESTUARY BY LINK

Link	Name of Hydrologic Subbasin	Alternative Route	Number of Direct Crossings	Name(s) of Direct Crossings	Name(s) of Indirect Crossings
Wyoming					
W22	Medicine Bow, Pathfinder-Seminoe Reservoirs, Upper North Platte	WYCO-D	0/1		Unknown
W101	Great Divide Closed Basin	WYCO-B, WYCO-C, WYCO-F	0/1		Unknown